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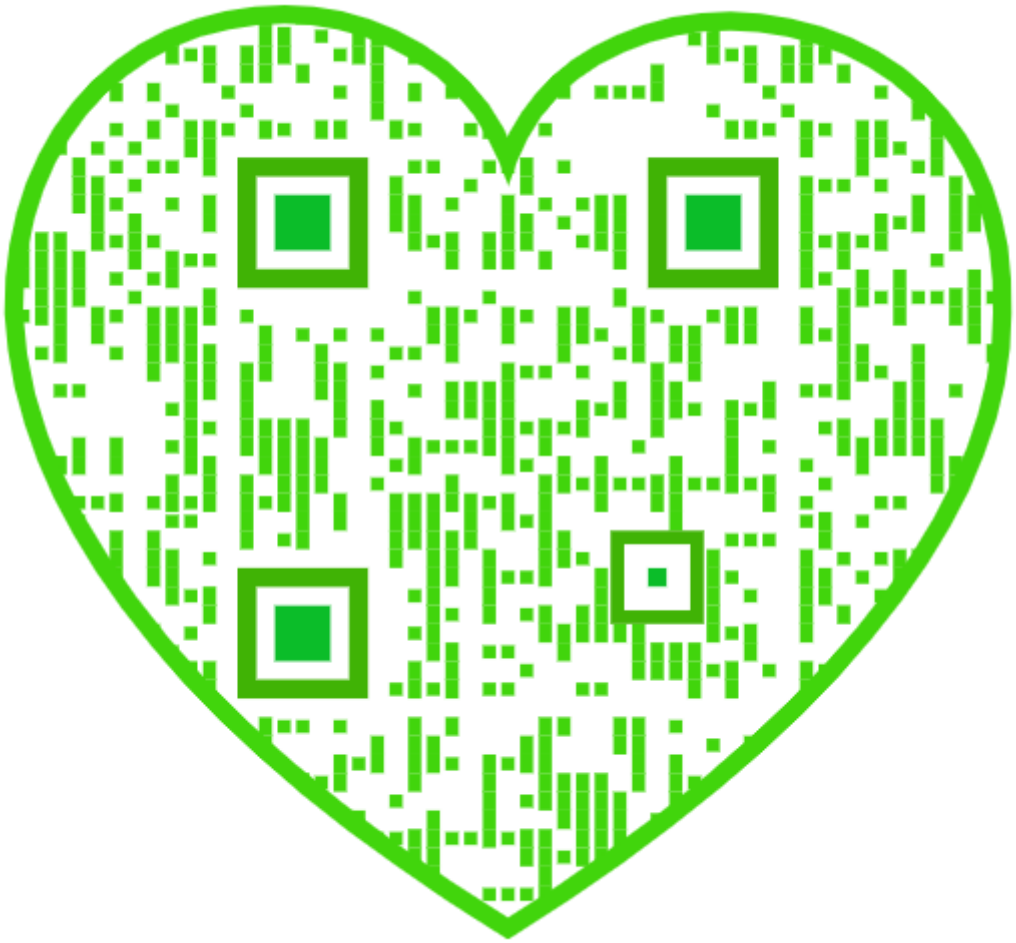

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A JOURNAL

Devoted to Scientific and Practical

BEEKEEPING.

VOLUME III.

PUBLISHED MONTHLY,

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Sincerely yours,

Moses Quinby

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MR. QUINBY, AND HIS LIFE-WORK.

BY P. H. ELWOOD.

A SCORE of years ought to elapse between a man's death and any attempt at his biography or estimate of his life-work. After the lapse of half that time it is plainly too early to write of Mr. Quinby, for his most intimate friends are just beginning to appreciate his merits as a beekeeper, his rank as an inventor, and his worth as a man; while his detractors and usurpers are just beginning to learn that "it is hard to kick against the pricks" of public opinion and have just begun to sink into a well-earned obscurity. Moses Quinby was born in North Castle, Westchester Co., N. Y., April 15, 1810. At the age of fifteen he removed to Greene Co., and three years after bought his first swarm of bees with money earned by working in a saw-mill. Here with nothing to aid him but a common school education, his wondrous love of nature and his remarkable observational powers, he commenced the study of the honey bee. For the first few years he had no bee books to aid him or to lead him astray in his investigations, and later nothing but seventy-eight pages by John M. Weeks and Bevan's work. He married in 1832 at which time himself and wife, for not complying with the requirements of their church in marrying, were "disowned" by the Hicksite society of Friends of which they were both birthright members. In 1853 he came to Montgomery Co., where he resided until his death in May, 1875. He commenced writing his "Mysteries of Beekeeping" in 1851 and published it in 1853.

Taking into consideration his surroundings with so few helps at his command, this must be considered one of the most remarkable books ever published in this country. On comparing it with the edition of 1865 it is surprising to find how little had to be rejected. To show how far he was in advance of his contemporaries, I may be permitted to refer to this work

written nearly a third of a century ago. I find that at that date he had been acquainted with foul brood for about twenty years, and that from his own experience he had discovered a method of curing the same. This "starvation cure" has probably not been improved upon by any of the more modern methods of curing it. His description of the disease is perfect and his ideas about its origin and spread are proven by recent investigations to be correct. That he should have aimed at these conclusions so many years ago with a hitherto unknown disease of so virulent a type and in box-hives, shows him to have been a born investigator.

It is universally admitted that the most difficult part of beekeeping is successful wintering; dysentery being the usual cause of death. We will quote what he says on this subject in his first book. Remember this was written before the most of us kept bees and even before many of us were born. "Physiologists tell us that innumerable pores in the cuticle of the human body are continually throwing off waste or worn-out matter, that every exhalation of air carries with it a portion of water from the system in warm weather unperceived, but condensed into particles large enough to be seen in a cold atmosphere. Now if analogy be allowed here, we will say that the bee throws off waste matter and water in the same way. Its food being liquid nearly all will be exhaled — in moderate weather it will pass off, but in the cold it is condensed — the particles lodge on the combs and accumulate. This water in the hives is a source of mischief. The combs are quite certain to mold. The water mold or dampness on the honey renders it thin and unhealthy for the bees causing dysentery, or the accumulation of fæces that they are unable to retain. There is not sufficient animal heat generated to exhale the aqueous portion of their food. The bees in these circumstances must retain the water with the excrementitious part which soon distends their bodies to the utmost, rendering them unable to endure it long. In a moderately warm day more bees will issue from a hive in this condition than from others; it appears that a part of them are unable to discharge their burden—their weight prevents their flying — they get down and are lost. When cold weather is long continued they cannot wait for warm days to leave but continue to come out at any time, and not one such can then return.

With the indications attendant upon such losses, my own observations have made me somewhat familiar and I suppose that inattention with many must be the reason that it is not discovered in cold weather at the time that it takes place."

Notice how perfect a description he gives of this disease. If there is anywhere else in the English language as good a statement of the usual cause of dysentery, I have failed to find it. If there

is any better science in any of the self-styled scientific works on bee-culture I have overlooked it. And as a correct theory leads to a successful practice, we are not surprised to learn that for many years before his death his average loss in wintering was less than two per cent, and this with the most disastrous loss about him.

His summer management was equally successful, and at an early date he probably marketed more honey in glass boxes than all other producers combined. And as he was among the very first to use the glass honey box, so he was first also in the use of the one-comb section, having these last in use several years before they were given to the public. He also proved the superiority of wood over tin as a separator before the public had heard of either. In 1858 he wrote, "*There is not the least doubt in my mind that whoever realizes the greatest profit from his bees will have to retain the movable combs in some form.*" The italics are his own. And yet we have editors and writers who speak of Mr. Quinby as though he was a box-hive man. The above quotation was written before ever a bee-journal was published in the English language.

Dzierzon has been rightly called the father of practical beekeeping in Europe and I have been lately much interested in reading his work on Rational Beekeeping first published in 1878. On comparing it with an 1859 edition of Mr. Quinby's book I find that the great German is more than a score of years behind our foremost American. Mr. Quinby has been called the father of practical bee culture in this country, but now we must include the whole world in the title.

Great honor is justly awarded Mr. Langstroth for the invention of so perfect a movable comb hive. Hanging comb hives of various patterns had been invented but it remained for a Langstroth to combine their various merits into one practical hive and introduce it among the beekeepers of this country. Mr. Quinby is entitled to equal or even greater credit for the invention of his new hives, for greater changes were necessary in order to make the Huber hive practical. Mr. Quinby quickly observed that bees did not winter as well in the Langstroth hives as in box hives on account of the spaces at the end of the frames and he set about to remedy it by making a closed-end frame. Dzierzon says on this subject, "These passages are unnatural, and they carry off the necessary heat and moisture from the brood-nest and winter quarters of the bees, so that colonies generally winter rather badly."

Abbott, late editor of the British Bee Journal says—"There is nothing more unnatural in hive arrangement than the absurd practice of making or leaving spaces round the frame ends." It is not necessary for me to draw any comparison between this hive and any other as a practical working hive for the beekeeper, but will content myself with

stating that Capt. Hetherington, probably the largest producer of comb honey in the world, uses the New Quinby hive in his extensive apiaries; and that Chas. Dadant, the largest producer of extracted honey in the West, uses the same.

I call particular attention to the last named because it has been said that the hanging frame is far superior for the extractor — a statement that after another year's experience I most emphatically deny. Let those who consider the hanging frame hive the only fit domicile for the honey bee recall this list of names, — Quinby, Dzierzon, Abbott, Hetherington, Dadant, and then acquaint themselves with the merits of this new hive before condemning it. The invention of the honey extractor was followed by Quinby's invention and introduction of his upright bellows smoker. Without the last, we could hardly use the first, and if we had to do without either, the most of us would choose the Quinby smoker. The upright bellows in combination with a parallel fire-box, etc., is undoubtedly Mr. Quinby's invention, and we should call all such Quinby smokers whether made by A, B, or C. No smoker before had this combination and no good smoker since is without it. Indeed so closely are all first-class smokers copies of the first smoker made by Quinby, that were they all shown to a disinterested person he would quickly pronounce them Quinby smokers differing but slightly in construction. He gave us a smoker and we will call it by his name. Mr. Thomas, editor of the Beekeepers' Instructor, a paper too good to live, speaking of buncombe claims of originality, says that "had not Mr. Q. made the first smoker we probably should never have heard of any made by Mr. B." Any *future* attempt to rob Mr. Quinby of the well deserved honor of this invention will meet with a well deserved rebuke from the beekeepers of this country. A quotation already made in his first book, "Its (the bees) food being liquid nearly all will be exhaled," shows how near he came at that early date to his later discovery that bees in common with some other insects may avoid dry fæces. Any observing beekeeper, after his bees are well wintered, can see this on setting them out in the spring. We know that some of our entomologists have not spent time enough to learn the truth of Mr. Quinby's discovery, but some of them perhaps might to their own advantage as well as ours, spend more time in original investigation and less in writing "scientific pleasantries" and in recommending the poisoning of our bees for puncturing grapes, when, as Mr. Quinby, who owned a vineyard, told them many years ago that the bees were not the guilty parties, a fact that they have not been able to disprove. Not one of this class can tell us anything reliable about the winter temperature of the bee hive and if they are as proficient and exact in their teachings on other insects, it certainly is time they set about enlarging the horizon of their know-

ledge. Had an entomologist made the discoveries of Quinby in the natural history of the bee it would have conferred immortal honor upon himself.

What shall we say of Mr. Quinby as a man, a man who spent his whole life for the benefit of others? When we read that a few men own nearly the whole of a country we know that many are poor that a few may be rich. And after one of these money kings or merchant princes has gathered to himself many times his share of the world's wealth, if he may choose to redistribute it in charity, some perhaps in educating the orphans he has helped make poor, we call him a public benefactor, a philanthropist. How much more a public benefactor is he who turns a part of the waste of this world into wealth for the benefit of his fellows! This was Mr. Quinby's life-work, and if he caused two pounds of honey to be gathered where but one was gathered before how many million dollars has he given to his fellow man? Who will compute it, for it amounts to more than the gift of a Cooper, a Peabody, or a Girard. With it he leaves to the beekeepers of America the rich legacy of a truly noble life: an example of that contentment with the comforts and a few of the luxuries of life which brings so much more enjoyment than a tiresome scramble for wealth. A contentment that gives leisure for the improvement of the mind, that gives opportunity to extend the helping hands to others, and time for laying up treasures "where neither moth nor rust doth corrupt and where thieves do not break through nor steal."

Thus to summarize our estimate of Mr. Quinby's life-work we place him as a practical beekeeper ahead of Dzierzon: as an inventor ahead of Langstroth: as a discoverer in the natural history of the honey bee, ahead of the present generation of entomologists: and as a public benefactor ahead of those who simply act as gatherers and redistributors of wealth already in existence.

Starkville, N. Y., Dec. 23, 1884.

FOUL BROOD.

By L. Stachelhausen.

Distinguished apiarists have of late so fully treated this subject, that it appears almost useless to say any more concerning it; especially has A. J. Cook, before the late convention of the Northeastern Beekeepers' Association[1] given a complete description of the theory and nature of this disease. Still more recently, Mr. C. F. Muth has described a simple method of cure. Notwithstanding this, I have decided to contribute my part towards the solution of this problem.

Before proceeding further I will touch upon some points in Prof. Cook's statement.

1. "There is good reason to believe that the minute spores do not

[1]Our readers will find that Vol. 2 of the "Apiculturist" contains the only complete reports of this convention. Ed.

adhere to the bees." This is not so. Schonfeld, in Germany, in 1877, and perhaps, prior to that, washed with distilled water some bees taken from a foul-broody colony, and found that this water contained mouldy pieces of the rotten brood. Further, the intestines of such bees, from the chylous stomach to the rectum, were filled with mouldy substance and bacteria. In the rectum were found only developed bacteria and no spores. Thence, it follows that a fasting method alone cannot lead to the cure of foul brood, but necessarily must be connected with inner and outer disinfection, if a certain cure is to be obtained. Yes, if a simple fasting cure would lead to the desired result, the bacterian theory, now generally acknowledged as correct, would thereby be contradicted.

The brood food produced by such bees will not, in the beginning, by reason of the fasting cure, contain bacteria or spores, and therefore the foul brood will not for some time come to light; but, as soon as the spores, which retain vitality for years, find again in the larva ground for their unfolding, the disease will break out again and most always with more violence than before.

Von Berlepsch, certainly a thorough bee-master, in the summers of 1865 and 1867 treated four such colonies in this manner and, as is to be expected, and he himself assures us, even with the utmost precaution, all four colonies became again infected with foul brood.

Von Dzierzon, also, in 1848, tried the fasting cure but it proved insufficient.

I would mention here that there have been cases in which the real malignant foul brood has disappeared spontaneously. In warm climates, this seems to be almost invariably the case.

It has lately been discovered in Germany, by thorough investigation that bee poison is a powerful antiseptic, and that the bees also use this property to preserve honey.

It is therefore very likely that this acid, under *favorable circumstances* is sufficient to destroy the foul-brood bacteria. If we have to consent to this, and also that the probability cannot be denied that under especially favorable circumstances the fasting cure can be carried through with success, so also it is shown in the theory of the foul brood, as given by Prof. Cook in such an excellent manner, that this cure alone is a very uncertain one. On account of the danger, which is connected with it, it should therefore *never* be used; more especially, as I shall presently relate, that we now know of a more simple and speedier method of cure.

2. Prof. Cook states that the spores of the foul brood fungus are especially to be found in the honey of a foul brood hive. But these spores keep the vitality also in the chylous stomach of the bees and Schonfeld has proved that the food which is given to the young larva contains, in a foul broody hive, a large quantity of such spores; that, consequently, this transplants the seeds of the disease into the young

larvæ. This is also of importance as bearing upon this theory, as bees that have been disinfected outwardly will produce food containing spores, and therefore through outward cure alone, the disease cannot be eradicated.

3. Besides the two methods given by Messrs. Jones and Muth (the older manner of treatment) Prof. Cook advises also, as the surest way, burning or burying of the affected colonies. Indeed, at the meeting in Michigan, the law was passed that even the beekeepers should be compelled to take the destruction in hand. But as I shall soon proceed to show we have now a speedy, sure and cheap method so that such a destructive proceeding can by no means be allowed.

Of still more importance is the circumstance that every beekeeper can with little trouble take care that his colonies are freed from the disease, even though there are foul broody colonies in the neighborhood. I would by no means claim that the individual beekeeper should not be compelled by law to exterminate the disease, but if he cannot or will not himself undertake the cure, he should not be obliged to destroy the entire colonies, but the cure should be executed or controlled by experts.

In the spring of 1882 I discovered in my apiary several colonies which were very foul broody. I used salicine acidification in different ways and in the summer the disease had disappeared, and has not shown itself since. Such a law as that to which I referred would therefore have caused me an unnecessary and very considerable damage. I will only briefly refer to the difficulty of carrying out such a law.

To-day, we are able to save not only the queen and the bees of a foul broody colony, but also their honey, comb and the still living or vital larvæ. Of course, the latter is attended with difficulty, and it is to be advised to renounce, in many cases, the preservation of brood and combs. After examining several methods, therefore, we have at last to ask the question, How is foul brood to be eradicated in the simplest manner?

(*a*) E. Hilpert, in Germany, has, in his time, described two different methods of curing with salicine acidification, by which, without doubt, one would be able to preserve alive all that is still vital. But these methods are more or less intricate, and a slight mistake makes success doubtful inasmuch as it preserves the disease a long while, and may likely be transferred to healthy colonies. At all events, Mr. Muth's method is to be preferred, by which however the comb and brood are supposed to be lost. A more recent method, which always meets with success whenever used is as follows. Instead of salicine acidification, common carbolic acid, which is inexpensive and easily obtained, is used as a cure. It is certainly poisonous and has a very strong odor, but if used in exact accordance with the directions, it is harmless to the bees. It is used outwardly as follows:

Put a tablespoonful of carbolic acid in a quart of water. Now if the foul brood is discovered at its primary stage, that is, if only a few colonies show the well known and often-described signs of the disease, all that is needed is to wash the bottom board of the hive with a wet brush with this mixture, and, as the carbolic acid evaporates, the bees and combs are disinfected. But at the same time, an inward application must be resorted to by feeding the colonies for several evenings with liquid food, which is prepared as follows: To every quart of sugar syrup or honey food, add one or two drops of carbolic acid, stirring it well. These applications (both inner and outer) are repeated weekly, until not a sign of foul brood is to be found. If, however, a colony is very badly affected, use the first-mentioned application, in the meantime caging the queen, until all the brood is hatched out. Then remove the bees to a disinfected hive and liberate the queen. If several colonies are foul-broody, all the combs can be given to one colony, and only the queen belonging to that colony need be imprisoned, and the other colonies should be given either empty combs or comb foundation. When the healthy brood has hatched from these combs, the latter should be brought into the bee house and thoroughly disinfected. This is done by removing the hive caps and placing the combs in a mixture of carbolic acid and water. In doing this, it is necessary that the mixture should fill every comb. It is therefore advisable to inject this water with a little syringe. If the comb contains honey, it can be thrown out and mixed with salicine or carbolic acid in the above stated quantity, and again be used as food.

This new method of treating foul brood, is taken from "Gravenhorst's Praktischer Imker."

All frames and utensils should be washed repeatedly with carbolic acid water; also the bottom boards of the hives containing healthy colonies and the bees given repeatedly disinfected food, because the spores of the disease are so easily transferred through robber bees.

(*b*) Without doubt, under some circumstances, it can be done differently, and yet a complete cure be brought about, if one only considers that the bacteria and their spores everywhere must be killed by a corresponding disinfectant. You can put all the bees in any empty hive which has been washed out with carbolic acid water and give them a new disinfected home; at the same time feeding them repeatedly with sugar and water containing salicylic or carbolic acid, but the whole hive is to be washed down at any rate with the addition of carbolic acid.

Also put salicylic acid to the honey that was taken out. But also in this case the bottom boards of the other healthy hives should be washed from time to time in the manner previously mentioned, with carbolic acid water and these receive disinfected food.

(*c*) From the above, the pre-

vention of the disease is self-evident; it consists in that you, as often as a cleaning of the bottom boards is necessary, viz., in the spring, proceed with the above stated washing, and add to the food as well as to the drinking water, a very small quantity of carbolic or salicylic acid. There is then always a means of disinfection to be found in the hive as is essential to prevent the spread of the disease.

Just now, as I am about to conclude this article, I find in No. 10 of the "Apiculturist" the communication of Chas. F. Muth, upon "Foul Brood." He says, "salicylic acid destroys all spores of foul brood with which it comes in contact, but does not penetrate the mummy which resembles ground coffee when scraped out of the cells." To judge from this method, when the combs are wholly immersed in carbolic acid water, these mummies which contain the spores of the foul brood in great quantity will soften, and these are destroyed if the comb remains long enough in the liquid.

At the end of the article, friend Muth describes a new method of cure, without using salicylic acid. It seems as if through this the present bacterian theory were contradicted. But that is not so, for during a plentiful honey harvest the bee poison [acid?] which is a good disinfectant, is separated in greater quantity than at other times, but the same time the brood is considerably limited. This therefore furnishes the most favorable case where the bees without outward help can be masters of the disease. But even in these cases, it appears to me that a washing of the bottom boards, often repeated, with carbolic acid water is to be recommended.

I do not dispute the possibility, however, that the disease, in such favorable cases, can be cured without the means of disinfection. I have already experienced such cases myself but I would not place any dependence upon it, but try washing with carbolic acid.

The same is to be said concerning Jones' starvation cure. It may prove all right, if it is followed by a good honey-flow or by a strong liberal feeding. But the proceeding offers too little security, requires more time and reduces the colony more than by the method which I have described.

To be sure, he who fights from incomprehensible reasons against every application of medicaments to mankind and animals cannot employ any different agents for the foul brood than fire and sulphur; but I doubt very much if he and the bees are any better off by that than by the use of a small quantity of medicine which would have saved the life of the whole colony.

Selma, Texas, Nov. 19, 1884.

WINTERING BEES.

BY L. C. ROOT.

I placed my bees in winter quarters, Nov. 19, in the order named

in my article upon this subject in your December issue.

The first day of December I weighed stocks as follows: In room *A*, one stock composed of three swarms united, No. 1, 52 lbs.; one single stock, No. 2, 52½ lbs.

In room *B*, one composed of five swarms united, No. 3, 76½ lbs.; one single stock, No. 4, 95 lbs. This stock is in a two story eight-frame, Quinby form of Langstroth hive. I left it very heavy to compare the effect with those that contained a less amount of honey.

I found one effect was to continue breeding later in the season than such as had the usual amount of honey. This fact I have noticed during several years past.

One stock in cone-shaped straw hive, No. 5, weighed 41¼ lbs.

The four stocks out-of-doors weigh as follows: one composed of three swarms united and packed with chaff, No. 6, 127 lbs.

One single stock packed with sawdust, No. 7, 134 lbs.; single stock packed in chaff, No. 8, 133 lbs.; double stock packed with sawdust, No. 9, 121 lbs.; one stock in attic, No. 10, 53 lbs.; one stock with empty hive below containing no sealed honey, No. 11, weighed 49 lbs. After weighing I gave this stock a comb which I had filled with six lbs. of sugar syrup. This is the stock referred to in paper No. 1, which is to be kept in a warm place, and fed from time to time during the winter.

The season so far has been very mild. Bees flew freely a few days before they were placed in winter quarters. Since that date the mercury has ranged from 20° to 34° above zero. In room *A*, the mercury has stood from 45° to 52.° In room *B*, from 42 to 58.

The bees were quite uneasy when warmest. It will be seen that the temperature will vary most in room *B*. We shall observe the results of this.

I shall refer to the stocks I have weighed by number hereafter, in the order above arranged.

Mohawk, N. Y.

A GUIDE TO THE BEST METHODS OF BEEKEEPING.

By J. L. Christ.
R. F. Holterman, Translator.

(Continued from p. 271, Vol. II.)

THE LOCATION OF AN APIARY.

In commencing beekeeping, the location of the apiary is of primary importance, as regards the abundance or scarcity of pasturage for the bees, because the honey-dews are scarce during many seasons. Those localities where there is an abundance of heather and buckwheat[1] are favorably known; also where there are many meadows;

[1] In buckwheat or heather localities, a good colony of bees can in fourteen days (if the weather at the time of bloom is favorable) carry in one hundred pounds of honey. It is however, of importance in such localities, which generally have few other honey plants, that the weather should be favorable during the heather and buckwheat bloom, which generally only lasts a few weeks; if this season should be unfavorable and the bloom is lost, the outlook is gloomy.

where woods, chestnuts, basswood, etc., are at hand; where many acres of fall or spring wheat, rape, field beans, etc., are grown; or any of the many honey plants grow, of which a list is given below. At the same time, the bees must not have to gather their honey more than half an hour's journey from the hive, as at a great distance too much time is lost. The nearer the flowers are to the apiary, the better; at the same time it is known that the bees have scented and even visited flowers an hour's journey from the hive.[2] [The Germans calculate distance by hours; one-fourth of an hour's journey being about a mile. R. F. H.] Yet they cannot carry in more than a third each day and hardly that; then, too, they have to encounter many dangers, such as rain, wind and destructive birds. But it is still more dangerous if the bees have to cross wide streams in quest of food as they are frequently lost, particularly when returning with a load, by winds which are more frequent and stronger upon water; but if the bees are not obliged to fly across it, a stream in the near vicinity is not detrimental, especially, if it flow in a northerly direction. Such an apiary is located at Offenbach near to Mainstrom, which does particularly well and which the owner intends to increase to one thousand colonies.

In the forest itself, the bees are well placed, if any one has opportunity to put them there. The bees not only find abundant pasturage and close at hand, but they are also protected from wind and can fly out and carry in, where others in level country must remain in the hive. They are more airy, more quiet and in a more healthy locality than if close to houses; but they are nearer their enemies particularly hornets and wasps, and in the swarming season, when they cluster, are more difficult to reach; while the advantages are greater near houses, yet there are more swallows, sparrows and other destructive birds about which capture more bees than in the forest.

[2]That they frequently fly more than an hour's journey to obtain honey I have had repeated instances of knowing. When, at certain seasons, the better flowers have ceased blooming, many bees come in with yellow golden lumps on their legs, and their heads and backs are also covered with a yellow substance which comes from the Genista, a yellow flower like the snapdragon; its seed is a reddish-yellow and is only found in a wood which is a good hour from here. How advantageous is it to have near, or at least not too far away, the plants of which the bee is to gather the honey! For not only can it make more frequent journeys, but it can also take a greater load. Of this I took careful note, and it impressed upon me the wisdom and forethought of the bee (I must so express myself). I perceived close to a hive a strong goldwurzel in full bloom, which the bees, particularly the wild bees, visited quite frequently. The highest sprig with blossoms reached the alighting board of the skep. A bee from this skep was engaged on the flowers in procuring a load for her legs. She commenced operations on the most distant sprig and worked towards her home and ended so that she only required to fly a hand's width to reach the porch of her city and there deposit her load. Whether she was so wise as purposely to commence farther and get nearer home as her burden increased, I would not like to say and state positively; but she gathered such a large quantity of pollen as I never before saw on a honey bee, and which she could not have carried fifty paces without being exhausted. Therefore, the closer the pasturage to the apiary, the larger loads can the bees carry, and the more frequent will be their visits to the flowers.

WHAT SHOULD BE IN THE LOCALITY AND WHAT SHOULD NOT.

In the vicinity of the apiary there should be small brooks; particularly are manure heaps and pools useful to the bees, from which they procure the salt-petre in solution, which they also obtain from freshly-upturned soil, from walls, and oftener from unclean sources but which is almost a necessity. Much more unpleasant and destructive is the smoke which comes from a bakery, brewery, smelting house or chimney and which can reach them. Bad odors, particularly from dead and decaying bodies, must not be permitted in the vicinity of the apiary. Near mills the bees must be so placed that no dust can reach them, which would cause the honey to ferment and spoil.

THE POSITION OF THE COLONY.

The colony itself must be placed so as to be protected from wind, especially the north wind, because of cold, and if possible from the west evening wind to keep the rain from beating against the hive. This may be done through shelter from brick houses, or where the lay of the place will prevent these winds, through fences of board or stone. One, however, must see that a narrow path is left between the wall and the hives, so as to permit handling the bees from the rear which if not imperative is at least very desirable.

Before all other things, it is however, necessary in starting an apiary, to see that it has a dry and warm location. This is a matter which has much to do with the success of the apiary. This warm locality, however, does not depend upon the sun always shining upon the skeps during summer, that it faces the south, etc. This may all be, and still the location be a wintery and damp one, which is very injurious to the bees. The place may be situated low and continue colder in the spring because the warm air has not access, or because of buildings, fences, trees, etc.; consequently the ground remains cold and chills the atmosphere for some distance above it. This is why the snow remains longer in such localities than in neighboring more elevated and open positions. A colony may be in a cold position through being placed on a bleak hill or where there is a constant draught, or so as to increase the draught if it comes from the northeast or east northeast. Thick large stone walls, immediately behind the bees, give out much cold air in the spring, cause dampness, etc.

Such cold locations are very detrimental to the success of an apiary, and if in addition to this they are damp they are positively injurious. A friend in the neighborhood some years ago complained to me that his bees would not thrive. They would neither give him swarms or honey and most absconded. I examined his location which was very nicely and well arranged but cold. After changing it only thirty paces the bees have done exceedingly well. The warmer

the location, the earlier will the bees swarm and the better will they thrive in every respect.

(*To be continued.*)

Rodheim, Germany, July 25, 1783.

EDITORIAL.

Once more and almost regretfully we realize that we must forever bid adieu to the old year, which, while it has brought to us so many cares, trials and burdens, has also been fraught with so many endearing and hallowed associations, and has developed and ripened so many new and valuable experiences and friendships.

To-day, as we realize that a curtain has gently fallen between us and the past, leaving us standing on the threshold of a new year, the untried and unknown future, we are more deeply impressed than ever with the importance of the mission upon which we have entered and the weighty responsibility which rests upon us as one to whom thousands of hard-toiling producers look for counsel and advice. Thus, it is only after mature deliberation, aided by advanced experience and a better knowledge of the varied needs of those in whose interests our journal is published, that we reach forward into the beyond, grasp the grand possibilities that may come to apiculture through a careful, thorough and systematic solving of all the great problems which come to us for consideration, and present them in as simple and practical a manner as possible to our readers.

It is not enough that financial success is crowning our efforts, but if after all that we have said and done, we have lightened no burdens, given no counsel or advice that has benefited our brother bee-keepers we have accomplished but little.

As this number of our journal will reach a large number who have not been acquainted with the object of our mission, our readers will doubtless bear with us patiently if we repeat some statements that we have made before.

It is a mistaken idea and one with which we totally disagree that, because on account of lack of organization and unsystematic management, our honey market has been glutted, that apiculture has reached its ultimatum, and hence no new fields open before us for investigation or development. On the contrary, we are free to state, fearless of contradiction, that when the great greed for individual gain and aggrandizement gives way to the loftier aims of equal rights and the desire to impart the greatest good to the largest number, apiculture will become a remunerative vocation and one in which we can invest capital with full assurance of abundant success, opinions of others to the contrary notwithstanding. Apiculture is properly and legitimately a branch of agriculture, and until this fact is recognized and every agricultural college in our country follows the example of the Michigan State Ag-

ricultural college, appointing as one of its teachers a professor of scientific and practical beekeeping and establishing in connection with it an experimental apiary for the benefit of its students, we shall not have completed our work or have fulfilled our mission.

While in the future as in the past, the bulk of surplus honey will be produced by the specialist, who in order to succeed should become thoroughly conversant with all the varied requirements of scientific apiculture, yet, in order that it may fulfil its mission properly and well, simple methods must be taught to the farmer, horticulturist and others, whereby they may keep bees, thereby supplying their own tables with nature's pure unadulterated sweets, and thus increasing their income by saving from $25 to $100 yearly, which to the average farmer is no small item, not to mention the advantages which accrue from having the bees to fertilize the fruits, grains, clover, etc.

This calls for a far different method of conducting our associations, bee-literature, and, in fact, every means through which one may obtain an apicultural education, than at present exists. This need has been recognized by such teachers as Moses Quinby, L. L. Langstroth, Samuel Wagner and many others, but has been almost buried out of sight by those, who in order to further their own interests at the sacrifice of the interests of others have monopolized, in fact, almost every means by which these ends might be accomplished; and while there are those who will take issue with us on this point, yet we are free to assert that many of those who have controlled and conducted our bee-literature are largely responsible for the fact that beekeeping in America to-day is in such a disorganized and unsatisfactory condition, and are further responsible for a large portion of the grevious mistakes that have come to apiculture.

We do not take this position unadvisedly, and were it not that the records of the leading bee-journals bear us out in this, it would be simply ridiculous and fool-hardy for us to make such statements, nor do we stand alone in this, for we only reiterate the statements of the more thoughtful and most prominent apiarists in America.

There is one association, however, whose members following in the footsteps of its founder, the noble and justly honored Moses Quinby, have, by speaking always on the side of right and justice (and this boldy and zealously in order to protect the rights of its members) incurred the wrath of these monopolists and for this reason everything possible has been done to ignore or injure it.

These are but a few of the many vexing subjects with which we have to contend, and which can all be practically and effectually solved if less attention is paid to monopoly speculation in the supply business and more thought given to the advancement of scientific

and practical apiculture, developing new markets for honey, etc.

After a thorough experience in every branch of the bee and *supply business*, we became fully confident that, until we had an independent journal and one which was entirely free from the supply business, and published in the broadest sense of the word in the interests of beekeepers, every attempt to correct the evils that threatened beekeeping would prove abortive; and it was only after weighing the matter carefully that we decided to enter the field and endeavor to give to the beekeepers of America such a journal.

We also remembered that while heretofore others had tried to accomplish this, but through lack of support and overpowering circumstance had failed, and also that every effort would be made to crush out any attempt that we might make, yet trusting in One who always favors and protects right and justice, and relying upon the intelligent and thoughtful apiarists who would rally to our support, we have embarked in this enterprise. How thoroughly we have laid the foundation for continued and effective work, we leave to the testimony of the hundreds of prominent and successful apiarists from every quarter of the globe, and the actions of the two leading beekeepers' associations, all of whom have pronounced the APICULTURIST one of the best journals published in the interests of beekeepers. Now we do not say this boastingly, for we are fully aware that had such an editor as that scholarly and talented pioneer of America bee journalism continued at the head of the journal that he founded until today, there would not have existed this need of reform.

It doubtless is not pleasant to some to hear their records as public teachers rehearsed and criticised, but we are not responsible if such records will not bear the pure light of impartial investigation.

Our object is to continue the publication of the APICULTURIST, giving our readers each month the richest thoughts and ripest experiences in as simple and practical a manner as possible, advocate the proper and thorough systematization of our associations as one great means for advancing and protecting the interests of beekeepers; encourage the researches in scientific and practical apiculture, whereby we shall be able to place our honey in the marts of the world not alone as a luxury, but also as an indispensable commodity, and open up new and better uses and markets for the same; devising effectual methods for obtaining accurate statistics regarding beekeeping, and protect the rights and privileges of the individual beekeepers against injury and wrong, extending freely to our readers the rights and privileges which accrue from an independent expression of thought through the public press; and indeed to devote our time and attention wholly and solely to the advancement of the cause of apiculture in its every branch and department.

In order that we may do this the beekeepers, in whose interests we are working, must support and sustain us. When the most prominent apiarists have freely and publicly endorsed our position and not only contributed freely of their funds but also have given to our readers some of the richest and most valuable thoughts and instructions ever given to the beekeeper, the masses of beekeepers who are to reap the benefits which result from such efforts cannot be so blind to their own interests as to withhold from us the needed support. If each beekeeper who receives a copy of our journal this month will contribute his dollar each year (a paltry sum when compared with what he receives in return) the work will be accomplished and we shall be able to present if possible a far better journal and also complete many plans which we are unable to do at present.

Just think carefully before you say that you cannot afford to subscribe for another paper, because you can never afford to sacrifice your own interests to save one dollar.

We have placed our bound volumes and the journal for 1885, at the low figures we did in order that all of our readers might secure our journal from the beginning, and if after carefully reading the Vols. 1 and 2, you do not find that they contain many times the value of the money paid for them we will take it back. There are a few who have not sent in their renewals, and we have sent them this number trusting that they will reply *at once*; otherwise, we *must* discontinue their subscription with this number. In closing, we wish you one and all a Happy New Year and abundant prosperity.

CORRESPONDENCE.

SHIPMENT OF QUEENS TO NEW ZEALAND.

DEAR SIR:

I mentioned in my last the expected arrival of a shipment of Italian queens from your part of the world to the order of two of our colonial apiarists. I see by the press that they duly arrived, by the last mail steamer from San Francisco, but unfortunately a large percentage of them were dead. They were sent by two of the leading beekeepers of your country, Mr. H. Alley of Wenham, Mass., and Mr. James Heddon, Dowagiac, Mich. Mr. L. J. Bagnall, of Thames, had eight from Heddon and six from Alley, and Dr. Dalziel of Pukekohe eight from Alley. They were sent by these gentlemen to Mr. T. G. Newman of Chicago, who kindly undertook to forward them to San Francisco, where on arrival they were taken charge of by the purser of the Pacific Mail Co S. S. Zealandia. They left Chicago on the 18th of Sept. last, arriving in Auckland on the 18th of Oct. and at Thames and Pukekohe on the 20th. They would thus be from 33 to 35 days on the way. On examining his, Mr. Bagnall found that of the eight sent by Mr. Heddon five were dead, while two of the others were rather weak, and have since died. One still lives and is I believe doing well. Mr. Alley's lot turned out somewhat

better, four of the six being alive, though two of them were so far gone, that they succumbed the next day. The remaining two are laying and do not seem any the worse for their long imprisonment, at least so Mr. Bagnall informs me. Dr. Dalziel was equally unfortunate, receiving only three alive out of the eight sent him by Mr. Alley. I have not heard whether he has managed to keep these three alive, as one at least was rather weak when taken from the box.

Mr. Heddon's were packed in a snug box with eight compartments, each compartment being furnished with a small section of honey. The box was covered with wire gauze for ventilation. Each queen was accompanied by a goodly number of workers, but on arrival these were nearly all dead. Only in two divisions were there any living and in these not more than a dozen altogether. They had consumed all the honey in most of the divisions. This may account for some of the loss, though in one compartment in which all the bees and the queen also were dead, there was a lot of honey left.

Mr. Alley's were in small boxes about $9'' \times 6'' \times 2\frac{1}{2}''$, with a 2 in. hole covered with wire for ventilation. The six boxes were made into one parcel. Each box was furnished with a small frame of sealed honey. In Dr. Dalziel's lot there were only three or four workers living, and Mr. B. had not a solitary worker left with Alley's queens, but there was no scarcity of food in any of Mr. Alley's boxes. In Mr. Bagnall's lot two of the frames were adrift, through the top bar breaking away from the ends of the frame. These boxes were in a bad state through the shaking about of the frames.

Naturally enough, the Dr. and Mr. B. are somewhat disappointed with the result, though I do not think it will deter them from trying again.

While I am on the subject of queen importation I will give the result of a shipment sent from Italy to the order of Mr. I. Hopkins, manager of the Matamata apiary. These were shipped on the 2nd of August and did not reach Matamata until the 26th of Sept. being in confinement some 55 days. Out of twelve sent six arrived alive but one was so weak that it died two days after. These were sent in larger boxes than those which came from America, and were furnished with more bees, more honey and water. It may be that the want of water was the chief cause of the death of so many of the bees sent by Messrs. Alley and Heddon. The water is supplied in small tin bottles placed neck downward in a shallow pan and so arranged that atmospheric pressure prevents the water running out faster than it is taken by the bees, out of the pan. I have given these matters some prominence as I feel sure that with attention to a few matters of detail, success will yet be attained in the transport of queens from America to New Zealand or *vice versa*.

The weather continues moderately favorable to the bees and swarming is becoming general. A Beekeepers' Assoc. has been formed at Coromandel in the Auckland province, Mr. J. D. Colebrook being appointed Secretary. Mr. F. Cheshire's paper read before the British Beekeepers' Assoc., on "*Bacillus alvei*" or foul brood, has attracted much attention in those districts where this disease exists. The local journal has given it in full and the "Cheshire cure" is now being tried by several. It is to be hoped that it will prove as effectual a cure as Mr. Cheshire claims it is.

N. Z. CORRESPONDENT.

Nov. 5, 1884.

A NEW MANUAL.

ED. AM. APICULTURIST.

THE various manuals of beekeeping are, in my judgment, lacking in one very essential particular, *i.e.*, they do not give accurate descriptions of any hive but the one their prejudice seems to favor. Thus Mr. A.B. C. does not seem to think any hive but his "Simplicity" worth mentioning; Mr. L. C. Root thinks the "New Quinby" the *ne plus ultra;* Prof. Cook describes minutely his modified "Gallup" and gives cuts of a couple of others, but as no descriptions are given, one is at a loss to decide whether the hive that is most popular in Canada is intended for a bee hive, a dog kennel, or a small barn; Mr. Newman starts a chapter on "What hive to use" but apparently cannot adjust his spectacles to see any farther than the Langstroth; Mr. Kretchmer describes his hive only, Mr. Reed the Mitchell; Mr. Alley can probably be excused for not describing any but his "double-walled and queen-rearing hives" as his book is intended principally to teach his method of queen-rearing. I might go on mentioning other manuals, but so far as I have read they are nearly alike in this particular, and unless the beginner is possessed of all of them he may choose a hive not at all adapted to his wants. There are a great many very valuable hives in use in America, each one containing some feature peculiar to itself and it seems to me if a book were written describing minutely those in use that are found to give excellent results, with a few lines detailing special management, such a work would certainly have a large sale. Each manufacturer or supply agent would, no doubt (for the better advertisement of his wares), contribute the necessary cuts descriptive of his favorite. By all means Mr. Editor, let us have the book. Who seconds the motion?

APIS CANADENSIS.

Kingston, Canada, Dec. 5, 1884.

NEW YORK AND FLORIDA.

DEAR SIR: On the twentieth of November I packed sixty colonies of selected Italians for Sanford, Fla., the remotest southern point where we have steamers daily from Jacksonville, a distance of two hundred miles north, and owing to poor management did not succeed in getting them here until sixteen days after shipment. Have them pleasantly situated, without any loss, in a fine orange grove, three and one-half miles southwest of Sanford and they are in a prosperous condition. Have brood in all stages in some, and all have started brood-rearing nicely so far. Bees swarm in this vicinity in March and April under ordinary circumstances, but think by stimulating can divide the last of February or the first of March. Our principal honey-producing plants in this vicinity are palmettoes, magnolia, and orange, and several swamp varieties of which I cannot give the name at this date. Bees are not bringing in much of any honey but are carrying pollen freely. No one in this vicinity pays beekeeping much attention, but all say the bees do well. Don't think there are any Italians in Orange county and if mine continue to display the same energy they have since I arrived no flower will bloom unvisited by them as they are the first I hear as I awake and the last to give it up at night. The mercury rose to-day to ninety-six, and ranges from eighty to ninety. Weather very fine at present.

C. G. FERRIS.

One year ago Mr. Ferris of Herkimer Co., N. Y., made a trip to Florida taking with him one colony of bees. The object of the visit was to investigate the advantages of that state for bees during the cold season at the north. The results of his observations were, as will be seen by the above, that he has taken sixty colonies of Italian bees and gone to Florida for the present winter.

Through the kindness of Mr. L. C. Root of Mohawk, N. Y., Mr. Ferris who was in Mr. Root's employ for several years (and has furthermore had ten years' practical experience with bees, which with him is an exclusive business), has kindly agreed to furnish the "Apiculturist" with monthly reports (under the above heading) of his experiment. ED.]

NOTES AND QUERIES.

— We are pleased to inform our readers that just before going to press we received a very pleasant communication from Mr. W. A. Pryral of North Temescal, Cal., who was the founder of the "California Apiculturist," and who is now conducting the beekeeping department in the Rural Pacific Press, stating that he will furnish each month for our journal communications from California under the heading "California Notes and Gleanings." These notes will be of great interest to our readers.

— We would call the attention of our readers to the fact that the Northeastern Beekeepers' Association will hold its convention in the City Hall at Syracuse, N. Y., Jan. 21–23, 1885.

We would urge all who can do so to attend; the meetings will be both interesting and instructive and it is well to remember that the majority of those who will take part in the discussions are among the most prominent and successful honey producers. We expect to be present and should be pleased to meet there many of our brother beekeepers.

—We had intended to have our journal out on time this month, but the death of the foreman in our office, together with other circumstances unforeseen and uncontrollable, rendered this impossible, but we think that the value of this number will more than make up for the delay. There are as yet a few who have not renewed their subscriptions, and we have sent them this number trusting they will find it for their interest to renew at once. We are aware that times are hard, but you cannot afford to give up the "Apiculturist" to save one dollar. We must, however, drop with this number all subscriptions that have expired.

— The matter of a new work on apiculture, as referred to by "*Apis canadensis*," opens up a broad field of inquiry, and we would refer our readers to the questions and answers, and especially to those given by Mr. L. C. Root, as valuable in that they touch upon this matter.

While we favor invention and improvement yet we are heartily sick of the almost endless and vexing variety of hives and fixtures, many of them worthless except as advertisements to one's own business. We are in favor of improvement in bee literature but would not lose sight of the fact that we cannot afford to sacrifice practical and valuable instruction in beekeeping for the sake of illustrating too great a variety of fixtures. If both can be practically combined all will be well.

—Will all those who wish Vols. 1 and 2 reply soon? We hope soon to dispose of the first edition of 1000 copies so as to issue another. It is as cheap, and yet as

valuable, an amount of bee literature as one ever purchased for the sum for which we offer it, and we cannot hold it at this reduced rate long.

— Will our Canadian friends and the Secretaries of Canadian associations kindly assist Mr. Holterman in the work that he has undertaken by sending to *him* such reports and other items as will make his department in our journal interesting and valuable.

— Mr. Frank Benedict of Perry Centre, N. Y., at the late convention at Rochester, was unfortunate enough to lose a small account book containing the names of parties who had paid for photographs taken there. If any of our readers were fortunate enough to find it, they will oblige Mr. Benedict very much by returning it to him.

— We have just received from Mr. Wm. W. Cary, jr., the sad intelligence that his father, who was probably one of the oldest beekeepers living in America (having been engaged in the business for fifty-two years), has fallen asleep.

In his decease, we have led to his rest one of the pioneers of American apiculture, and one with whom L. L. Langstroth associated in conducting many of his early experiments. His loss will be deeply felt by the dear ones left to mourn, and we extend to them our heartfelt sympathy during these hours of trial.

His son, Mr. Wm. W. Cary, Jr., who for a long time has been a member of the firm of Wm. W. Cary & Son, will continue to conduct the business, and he has only to follow in the footsteps of his father in order to retain the regard of the beekeepers and meet with abundant success.

— We have just received from Mr. Holterman, but too late for publication, the reports of the Haldimand association.

CONVENTION NOTES.

— The Cortland Union Beekeepers' Association will hold their next meeting in Cortland, N. Y., Jan. 27, 1885.

M. G. DORBY, *Sec'y.*

INTERNATIONAL BEE-KEEPERS' CONVENTION.

IT is proposed to hold an International Beekeepers' Congress on the Exposition Grounds during the 24th, 25th, and 26th of February, 1885.

An interesting programme of subjects will be presented and discussed of great importance to every beekeeper in America.

The disposition of our honey product with a view to secure better prices will be fully considered.

At the same time there will be an exhibit of bees and apiarian supplies.

Fuller particulars will be given hereafter.

At the time selected, the Exposition will be at its best, and excursion rates low. The beekeepers of our country should lay aside business for a week or two, and made every exertion to attend this Convention.

Come prepared with facts and statistics, and ideas arranged, to take part in its deliberations.

Dr. N. P. ALLEN, Smith's Grove, Ky.
W. WILLIAMSON, Lexington, Ky.
Dr. O. M. BLANTON, Greenville, Miss.
P. L. VIALLON, Bayou Goula, La.
Judge W. H. ANDREWS, McKinney, Tex.
W. S. HART, New Smyrna, Florida.
S. C. BOYLSTON, Charleston, S. C.
Dr. J. P. H. BROWN, Augusta, Ga.
H. C. AUSTIN, Austin's Springs, Tenn.
R. C. TAYLOR, Wilmington, N. C.
J. W. PORTER, Charlottesville, Va.
S. VALENTINE, Hagerstown, Md.
Mr. J. P. H. Brown, of Augusta, Ga.,

extends to us a very cordial invitation to be present at the convention at New Orleans, and it is with deep regret that we replied that it would be impossible. Our brother beekeepers however, have our best wishes. Nothing pleases us more than to see the growing interest in association work. We are looking forward for grand possibilities in this regard in the near future.

We but here repeat the call and urge all who can possibly do so to take a trip to New Orleans and help to make the convention a grand success. ED.]

QUESTIONS AND ANSWERS.

QUESTIONS BY THE EDITOR.

1. It is a fact that the country is flooded with so great a variety of hives and sections that the beginner is puzzled to know which to choose.

Now do you consider this state of affairs beneficial to the best interests of Apiculture, and why is it so? Also do you think that it is possible to devise a simple hive and one that can be, easily constructed that is worthy of general adoption by the beekeepers both of the North and South?

2. What do you consider, in the light of your own experience, the duty of the beekeepers regarding any and all kinds of adulteration?

3. How can the small beekeeper, who owns only a few colonies, secure his honey in the simplest manner possible and dispose of his surplus so as not to conflict with the general honey market to its injury.

4 Some of the best beekeepers of the world are opposed to conventions and such publications as tend to increase the number of beekeepers and encourage the production of honey. Is their position well taken?

5. How can we best call the attention of the public generally to the value of honey as food and medicine, thereby creating a greater demand for the most natural and desirable sweet known to the world?

6. What is the most important question of the day in relation to our pursuit?

ANSWERS BY J. E. POND, JR.

1. I have for a long time been of the opinion that a standard frame would prove decidedly advantageous; in fact I can hardly conceive of any disadvantage that can arise from the adoption of such frame. I can however see no way in or by which a unity of ideas can be brought about, to focus upon any one form of frame that can be devised.

A standard frame should and must be a compromise; such compromise must retain the good points and drop the poor ones. So long as there is so great feeling upon the subject, and apparent belief that upon this or that particular form of frame depends the success of the upholder thereof, just so long shall we be obliged to take things as they now are, and make the most we can of them.

2. The duty of every honest man is to set his face hard against any and all adulteration. Policy should have no place in the matter. Exposure should follow every known attempt, and every man should be shown that disgrace would attend any attempt on his part to adulterate even in the least degree any of our products.

3. By working up his home market thoroughly; the great trouble has been that every one is anxious to work off his goods too speedily.

It may be a little trouble so to do, but there is no question but that large quantities of honey might be sold within a stone's throw of one's own dwelling if pains only were taken to develop the trade. Instead then of rushing off at once to some commission house let the producer inform his neighbors and the near public that he can supply them with a choice article of pure honey, and it must needs be a very thinly settled locality that will not make a market for the yield of quite a large apiary.

4. The only arguments that I have yet seen are based on selfishness. No position in my mind is well taken, that does not tend to broaden and deepen one's mind, and give him wiser and better views in regard to the world at large. Conventions and special bee literature willhave such effect; no one can for a moment doubt this. The laws of supply and demand, production and consumption, are the only means by which the production of honey as well as other productions can be controlled, and the sooner the would-be specialist in this direction finds this

out, the sooner will he grow contented to take things as they come, especially when he can do nothing that will make them different.

5. By agitation. Comparatively few to-day know the great value of honey both as a food and medicine. Were its value as a medicine thoroughly known it would displace in thousands of families, the domestic remedies, or quack compounds now depended upon by them as cure-alls.

If every beekeeper in the country would write a series of articles for his local weekly newspapers upon the value of honey, etc., it would soon create a demand to supply which would require a much larger quantity than is now produced.

6. The marketing our honey. The law of supply and demand regulates itself as a rule; still a demand can be created, at any time by a little effort. Honey is now looked upon as a luxury; Its value as a remedial agent in many diseases is unknown. All that is required on the part of the public is to know its value and an immense demand will be found to arise for it. There is no reason why judicious advertising should not cause a demand for a product of the value of honey, when it will set the world crazy over some humbug quack poison.

If the beekeepers of every section would associate themselves together with a community of purpose and interest, they would soon become a power that would be felt; so long as they undertake to work apart, they will be like the bundle of twigs, weak when separated; strong as a steel cable when united in harmony.

Foxboro, Mass.

ANSWERS BY G. W. DEMAREE.

1. I think the great variety in hives, sections, etc., a misfortune to beginners. I call to mind this minute beekeepers who are doing poor work in their apiaries from year to year simply because they adopted an inferior hive and implements at a time when they did not know any better. The facts show that the standard Langstroth hive is in use by successful beekeepers in every state in the union, and perhaps the same may be said of some other hives. This indicates that it is possible to construct a hive that will answer every purpose in every section of the north and the south.

The whims of beekeepers are a greater barrier in the way of adopting a standard hive than all the difficulties in the way of its construction. This hive business has nearly ruined the bee interest. The meaner the hive, the more blowing is resorted to, to induce the ignorant to buy it.

2. In view of the fact that the adulterators of the present time are undermining the health and the morals of the people, we should have no doubt as to what our duty is. We should expose the thieving business at all times, and on all suitable occasions. Much has already been done in this direction. A few years ago, glucose honey was sold openly in the stores here, and people talked about recipes to make honey.

Glucose sugar and glucose syrup were as common as our daily bread. Well, the few first articles I wrote in our local papers, exposing the fraud, brought out some opposition and some attempt at ridicule, but I battered away at the sneaking business till it slunk its dirty self away out of sight. The great masses of the people have no sympathy for the sly craftsmen, hence, all that is necessary is to educate them. I have about as much patience with the conceited wise man, who proposes to kill the adulterators by "letting them alone," as I would have with the farmer who proposed to kill the weeds in his cornfields by "letting them alone."

3. Anything that is worth doing at all should be done well. There is no reason why the small honey producer should not put his honey, which he desires for the market, in as good shape as the larger producers do. If he does this he is not in the way.

4. I think they set their colter too deep. Conventions in our state have helped the honey market. I used to sell a little honey at a big price, and that was all that I could do. My bees would not pay me now in that way, as we must sell honey by the tons. We accept "demands" for large lots of honey at lower prices, rather than little or no demand at high prices. The greatest enemy the honey producer has is, those publications which are published in the interests of the proprietors whose business it is to collect money from other people to pay their advertising bills, and to allure a lot of blockheads into the "bee business" in order that they may sell them a lot of supplies. The only remedy is to "take off the feed" and let such fellows run their own shebangs.

5. Build up your home market. More can be done by letting the people see and taste your honey than in any other way.

6. The best method of counteracting the evil influences of monopoly and rings.

Christiansburg, Ky.

ANSWERS BY J. B. HALL.

1. Most of the various hives now in use have been got up by parties that are *not practical* apiarists, and could not make a living by producing honey, so have constructed various fancy models, based upon theory only, and promise them A 1 extra, it being only necessary to own about a dozen of such, and put bees into them, and all will go well, and the owner will be able to reap large, yes, very large, yields of honey, and that without so much as getting a sting.

I cannot understand the reason that the beginner should not expect to be puzzled. If he enter any of the professions or trades of life, he does not expect to be perfect at the start, but on the contrary, to expend time, labor and money, to accomplish his desires.

If by apiculture it is meant (if it is possible) to teach every person the successful method of keeping bees profitably, my answer would be *no!* but if by apiculture it is meant those already engaged in and those intending entering the profession *for a living*, my answer would be *emphatically yes*, and the why so, that a practical man in a good location for honey, can make a success with any kind or shape of hive with movable comb frames, and soon find what his special field demands, and will act accordingly.

There is nothing impossible in the improvement in hives, but uniformity in hives for the far south and northern extremes, and all the intermediates, I think not desirable, any more then uniformity in dwellings, stables, vehicles, clothing, etc.

2. To put his name and address on every package of honey, no matter to whom sold, and here in Ontario, enforce the good law we have against adulteration of *food*. The first offence for making or selling is $100 fine and the third offence imprisonment I think.

3. This is a sticker to me as I expect to all specialists. The small men, as you call them, *will not* take honey in good shape, and if they by chance get a few hundred pounds more than the family will be likely to use, it is rushed on the market in July (I have known it to be in town five hours after it is extracted) and disposed of for any price, and for any trick, or trade, thus breaking the home market. One of my neighbors in July called to ask if I would fill an order that he had taken, expecting to have lots of honey to supply. He found that he would have to feed his bees, and buy honey for the family use. This same man retailed honey 5 cts. per pound less than even sold by me. I cannot give them advice as they will do as they please, living in a free country.

4. I am of the opinion that the best beekeepers are not opposed to conventions and publications but they are indifferent to them, and take no part, because to them they are one-sided, they gain nothing for the time and money expended, also that they wish the production of honey to be increased but are disgusted at the way the novice acts when he has honey to sell.

5. Cannot say.

6. The stamping out of foul brood, so called. Condemn and contradict the following statements:

The gush about large yields of honey with little capital and labor.

That it is very pleasant and profitable for weak ladies and gentlemen to keep bees.

That there is no hard work in the apiary.

That it is all profit as bees work for nothing and board themselves.

That the pure Italian bees are the best.

That clipping the wings of the queen hurt her or the colony in any way.

That properly reared (artificially) queens without the swarming fever or impulse are not as good and in no case better than those raised at swarming.

Woodstock, Ontario.

ANSWERS BY L. C. ROOT.

1. I consider this great variation in the forms of hives very objectionable. There are many reasons why a standard hive and section would prove of great advantage. Bees could be purchased more advantageously. If one desired to sell his bees, hives or sections, his chances of doing so to advantage would be much greater. Surplus combs, empty, or filled with honey, would often be a desirable purchase. In fact the general confusion incident to this great variety of hives would be removed. This diversity has arisen largely from the selfishness of individ-

ual beekeepers and supply dealers, through their desire to use or sell something different from others. Doubtless each was devised in the belief that it was an improvement. We shall never establish a desirable standard in beekeeping fixtures so long as the majority of supplies are manufactured and sold by dealers who have their own text book which illustrates and describes their own style of hives and sections, and who publish their own bee journals to educate the public and recommend their own goods. There must be less selfishness, and more of a broad and generous spirit, before the greatest good comes to the greatest number. The outlook is brightening, and I think the tendency of the future will be in the direction of a reduction and simplification of the forms of hives, until the hive indicated in the question will become a possibility.

2. I think that adulteration in connection with our pursuit is practised very little if at all by beekeepers. The greatest need is, that we talk and write less about it.

3. This is an important question and one to which I have given much thought. I am inclined at present to advise such to use a hive that will contain about 14 frames, 10×15, and allow their surplus to be stored in frames at the outside of the brood nest. This honey can be cut from the frames and sold directly to the consumer.

4. The history of the past during all ages proves the position of such persons incorrectly taken, when viewed from a broad and helpful standpoint. To argue otherwise would be to hold in ungrateful remembrance the names of so many noble, self-sacrificing men who have worked with such untiring zeal that we of to-day may enjoy the fruits of their labors. Would space admit I should be glad to mention the names of some of our honored dead and refer to their unselfishness.

5. My first suggestion would be that in our conventions and bee literature we call attention more frequently to pure honey and less to the reverse. We have done far too much advertising which has unnecessarily done us great harm. I would urge losing no opportunity of displaying the most HONEY, where it would attract the attention of the greatest number possible. We should endeavor to prepare our packages in neat and attractive form. Above all it must be produced in such a way that it will not be sticky and disagreeable to handle; showy labels and striking placards are also valuable.

Properly printed slips well-worded explaining the value of this pure and natural sweet should be furnished with each package. If such slips could be very generally distributed they would be valuable educators. We should see to it that no department at our fairs make a better display than our own.

In short it simply means hard work. If we are equal to the emergency, success is ours.

6. Were I to answer this question in the broadest and most unselfish way I should say that the most important question would be, How can we save the millions of pounds of honey which are annually going to waste, and create a demand for the same at reasonable prices?

In Switzerland honey is as common an article of food as is butter in America.

If we can educate the American public up to this standard the problem is solved.

Mohawk, N. Y.

LETTER BOX.

Mohawk, N. Y.

DEAR SIR:

I have been examining your club and premium list given in the Dec. number and it seems to me that many of your readers will avail themselves of your very liberal offers.

Your offer of all of the back numbers (Vols. 1 and 2) consisting of twenty copies bound in one volume in cloth for five new subscribers is one that should induce many to strive for the prize. I shall be surprised if your very generous offers are not largely taken advantage of. L. C. ROOT.

Poughkeepsie, N. Y., Dec. 11, 1884.

IT is with pleasure that I renew my subscription to the "Apiculturist" for it has been of great value to me during the past year; and I could not do without it. I shall try to send you at least one new name. S. E. WILEY.

Clockville, N. Y., Dec. 5, 1884.

Please find inclosed $5.00 for my subscription for the "Apiculturist" for 1885 to help it along on its onward march. W. V. BOSWORTH.

The American Apiculturist.

A Journal devoted to Scientific and Practical Beekeeping.

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All communications should be addressed to S. M. LOCKE, Salem, Mass.

MUSCULAR STRENGTH OF INSECTS.

BY ARTHUR TODD.[1]

THE muscular system among the insects yields in no point so important a power as that of the Vertebrata; we may even affirm that it is capable of developing a force infinitely more considerable.

To make this fact more understood, Mr. Felix Plateau has undertaken a series of experiments of a most positive character. He has caused little carriages filled with heavy weights to be dragged along by heavy beetles thus transformed into miniature oxen. Insects with good flying powers he has changed into imitation birds of prey by loading them, and he has established the grand fact that the muscular power is in a ratio contrary to size, the smallest insects being capable of putting forth the greatest effort; He has established the fact that a beetle is infinitely stronger than a horse, that it is even twenty-one times stronger; that a bee is thirty times more vigorous. In fact that a horse can only exert a force equal to the sixty-seventh of its weight, and a beetle draws easily a load equal to fourteen times its weight, whilst a bee fastened to a little carriage, can easily put in movement a weight twenty times that of itself.

In other words a beetle can easily draw or pull fourteen of its companions and a bee twenty.

Philadelphia, Pa.

[1]A translation.

WINTERING BEES.

BY L. C. ROOT.

DURING the month of December the weather here has been very changeable. The month as a whole has been much milder than is usual.

At one time during the week before Christmas it was very cold, the mercury falling as low as 35° below zero.

The highest point indicated dur-

ing the month was 48° above zero. Mercury in room A fell as low as 40° during the coldest weather. I was absent from home, and room B was not tested. During the warmest weather mercury in room A was as high as 55° and in room B 62°.

The first day of January I weighed stocks as follows: No. 1, 35 lbs., No. 2, 51 lbs., No. 3, 67 lbs., No 4, 92½ lbs., No. 5, 39 lbs., No. 6, 117 lbs., No. 10, 50 lbs., No. 11, 52 lbs.

It will be noticed that the results during the first month do not seem to prove very favorable to doubling several stocks together. It is very evident that No. 1, No. 3, and No. 6, have not been "hibernating." No. 1 has consumed 17 lbs., No. 3, 9½ lbs., and No. 6, 10 lbs., while No. 2 consumed but 1½ lbs. No. 1 was set on top of No. 2 and it is possible that honey might have been carried from No. 1 to No. 2.

A more certain test of the amount of honey consumed by the stocks doubled together and a single one is given in No. 3 which consumed 9½ lbs. and No. 4 which consumed only 2½ lbs. No. 11 weighed 49 lbs. Dec. 1, and at that time was fed 6 lbs., making 55 lbs. It will be seen that this stock has consumed but 3 lbs. of liquid honey. After weighing it Jan. 1, I gave it 4 lbs. of liquid honey making it weigh 56 lbs. No. 1 had consumed so much that I filled 8 hanging frames with liquid honey and placed them in a hive and set it upon the top of the stock. The hive, combs and honey weigh 61 lbs. This added to the weight Jan. 1 makes all weigh 96 lbs.

Many will remember that the season of 1869 was one of the poorest if not *the* poorest season known by any beekeeper.

From experience gained during that season I decided never to feed bees to any extent at the close of such a poor season when the bees were all old, from brooding being discontinued so early. This year I found bees in about the same condition as regards brood and as a result I doubled many of my stocks.

I do not anticipate any marked success in wintering under the circumstances. When I give the results in loss of bees from Nov. 19 to Jan. 11 many will predict for me entire failure.

From room A, I took about one bushel of dead bees, and from room B about three pecks.

Colony No. 6 has worked out quite a large quantity of bees. It is impossible to estimate the quantity accurately. I notice by an oversight, I omitted to weigh any of the stocks in 12 Quinby frames. I regret this as I desire to call particular attention to the wintering of these stocks. Many will consider this far too many frames for successful wintering, and it certainly would prove so with any other than the closed end Quinby frame. I make this experiment hoping to prove that one may be successful in wintering with this frame even with this number of combs.

Miss Lucy A. Wilkins, of Michigan, asks if I am making observation

as to the time the bees commence breeding, in my experiments in wintering. There is no doubt but that this question is important in connection with successful wintering. From the fact that one of the necessary requirements for successful wintering is that bees be left comparatively quiet and undisturbed, it will be seen that it is a very difficult matter to ascertain without harming the bees.

Every time the bees were disturbed it would tend to induce brood rearing. When I notice two stocks standing in the same room each of which was prepared for winter as nearly alike as was possible, one of which remains quiet, and the other uneasy, I feel inclined to examine both and ascertain their condition as to brood, etc. If there are those who have stocks of native bees to which they introduced Italian queens late in the season, they may be able to give us some light upon this subject by giving their success in wintering and the facts as to how many Italian bees have been reared during the winter, and which have wintered best, those which have most or fewest of Italians.

Mohawk, N. Y.

WHY NOT KEEP BEES?

By W. G. Phelps.

This is a question arising in the minds of some, who in tight times like the present are casting about for opportunities "to turn an honest penny." There is no doubt but that the energies of such, if turned in the direction indicated, might be put to profitable use and excellent results accomplished. Though bee culture is now ranked among the *special* avocations of many, throughout this broad land, yet this fact need not deter any from engaging in it even as a supplementary means of livelihood. Preëminently does it commend itself, coupled with truck raising, fruit growing, poultry breeding, and kindred pursuits and may add, in fact has added, to the support of many a family in America. As an auxiliary source of revenue, certainly no rural home should despise it. Keeping bees, when the proportionate attention is paid them that is devoted to other branches of rural industry *pays*, and pays well. To this fact hundreds engaged therein can testify. A popular idea, and one that has led to many a failure with bees, is that bees can be purchased, surplus boxes clapped on (or worse yet a "cap") and the bees left to work wonders. Thus managed with no attention, save to "rob" them in the fall, it is little to be wondered at that "beekeeping *don't* pay." They cannot be let thus "severely alone" and made a profitable source of income or pleasure. *Pleasure* did we say? Is it possible, some reader asks, that those irascible "critters" can become a source of pleasure to one? Ah! my friends, you do not know them. Not least among the pleasures of country

life is the joy experienced in caring for the apiary. To watch and control the work incidental to a live beekeeper's occupation is not only healthful but pleasurable. With the first natural dread overcome in handling bees (a dread easily conquered) no one, who in the least enjoys investigating the wonders of nature, can fail of enjoying the study of what some term "*Beeology*." Of course it would be impossible to go into details in so short an article. The principles of the pursuit are well laid down in works like Langstroth's "Hive and the Honey Bee," Quinby's "Mysteries of Beekeeping," the "A B C of Beekeeping," Cook's Manual," etc. These *well read*, the manipulation of bees practised in the proper season, and a start has really been made. Progress and success in the occupation depend largely upon the individual's skill and intelligent management. A loose or spasmodic attention to your "pets" will result in poor returns and perhaps put yours in the catalogue of "blasted hopes." While a *perpetual* "fussing with bees" is not commended, prompt, intelligent, and systematic management at special seasons must certainly be observed if we are to look for satisfactory results. Like all other farm commodities the price of honey rules low, but the demand for it is constantly increasing. Those largely engaged in bee culture are compelled to admit that there is little danger of over-production. On this point the Messrs. Dadant (extensive honey producers of central Ill.) says," The production of honey has not been, and cannot be, overdone. Extracted honey can be produced at 6 cts. per lb. (half its usual price) and pay its producer. The consumption increases as fast as the production, and honey will *always* be the highest priced of all sweets."

With many such testimonies in favor of the increased production of so healthful a sweet as pure honey, let no one be afraid to venture. There is room for all.

A GUIDE TO THE BEST METHODS OF BEEKEEPING.

By J. L. Christ.

R. F. Holterman, Translator.

(Continued from p. 13, Vol. III.)

Regarding the space in front of the hive for flight although it is well to have as great a distance as possible, or at least twenty to thirty paces free for flight to and from the hive, yet if the locality will not admit of a perfectly free access it will do no great injury if the bees do have to fly over high walls and buildings to procure their nourishment; they frequently do this of their own free will and without being compelled. My bees are surrounded by buildings and fly over the church without any disadvantage. The only thing is that they are at a greater elevation more easily caught by swallows or overtaken by a sudden thunder-storm and are lost.

The ringing of the church bell does not affect them in the least, though their sense of hearing is not at all deficient as they can in the hive make each other understand through the different kinds of humming. The concussion of the atmosphere has little effect on them, but so far as their dwelling, or the ground upon which it stands, is concerned, they are extremely sensitive to this and the tread of a man alongside of a hive is felt by them; therefore colonies are not well placed if near a paved street over which many wagons pass especially in winter, and another disadvantage is the dust in the summer when blowing towards the hive. Therefore all places should be avoided for an apiary where one must expect strong concussions, viz.: where the platform touches a shed, where through threshing of grain in the winter the bees would be disturbed and irritated and caused to eat more. The same thing happens if the platform touches a smith's shop where the blows and jars can be communicated to the platform. At the same time if the platform is isolated it is sufficient that the sound itself has no impression on the bees.

High trees about the bees are well if they do not hinder the morning sun, but the noon sun is weakening and at that time the bees require shade, and they have the advantage that the swallows do not fly so much under them; but if one does not increase colonies by dividing and lets them swarm, high trees are sometimes very inconvenient, as the swarms like to attach themselves to them, and they are procured with difficulty and danger. Low trees, shrubs, and grape vines, etc., simplify procuring swarms and make the surroundings pleasant.

I would particularly advise lovers of bees to plant quince trees in front of their hives. I have frequently remarked that swarms like to attach themselves to these and prefer these to other fruit trees. The natural cause may be this, that these trees are dense with branches and foliage, consequently give the clustering bees shelter and protection from the hot sun, which they look for and sometimes find necessary to procure. Then, too, perhaps many bees belonging to the hive may be accustomed to fly to the quince tree as during its bloom they find much nectar in its flowers; it blooms almost every year and generally yields much honey, making the road to the tree a well known one. The bees easily follow it, and the first ones show the queen and remainder of the swarm the way to it and thus cause their clustering there. These trees (the quince) are otherwise the best and most serviceable before a colony in the garden as partly they do not grow high and the swarms are more easily secured and partly because they can be pruned and cut to any shape so as not to injure the growth of vegetables under them by much shade. The fruit, too, in the fall, can be of economic and medicinal use, and is excellent for food besides being a refreshing and invigorating drink. The juice is healing

for a sore throat, and the quince sliced and baked, mixed with other baked fruit is very palatable. The quince kernels are an excellent mitigation for pains when arising from burns, and how excellent they are applied to sore breasts.

Next, a good beekeeper will keep the ground clean, free from high grass and bushes, and either put under and about the hive cement so one can clean well, or put down boards or sand of a coarse quality. This order and cleanliness about the hive have this particular use during the swarming time; one can find the queen more readily if she, in coming out through absence of wings, or of deficiency, drops in front of it, which causes many swarms to return to their hive; and if the queen were not found, it would be two or three weeks before another queen could be reared and during which time so many bees are idle and the new swarm comes so much later.

THE SITUATION OF THE APIARY AS REGARDS SUN.

The locality will perhaps have to decide the position of the apiary as regards sun, but the entrance and back of the hive should not face the evening sun nor towards the southwest much less facing the north, but their entrance should be to the southeast or, best, between the morning and noon sun. Where they have to be placed facing the noon sun it is well to be shaded from the heat, for the bees are not only hindered by the heat from their labors, while those in the shade are busily at work, but it will sometimes happen in a young colony which has the combs very tender and sometimes not fastened securely that the combs and honey will break down and the bees become suffocated. If the combs should break down one should at once put wet bags about the hive and place the hive upon another stand. Particularly are young swarms often driven from their hives the second or third day by the sun when they have combs a hand's width in breadth with honey and brood in them, and their owners say the bees had another locality in view. All this can be prevented by a covered and well arranged bee-stand and where the roof in front projects so far that the hive is fully shaded by half of the projection when the sun is at its highest. The morning sun is valuable for the bees especially in summer, especially the weak colonies also the noon sun in spring, the robbers appear to be the worst before colonies upon which the sun shines much.

To be continued.]

EDITORIAL.

Apiculture in America is now passing through a most trying ordeal and one from which it will come forth in better condition, and founded on a more solid basis, than ever before even in more favored times.

A glutted honey market and depreciation in the prices of honey are powerful factors that are awak-

ening the more thoughtful among the beemasters to a sense of their duty and the necessity for immediate action and concentrated effort.

Far too much time has been devoted to the discussion of pet theories and individual hobbies which even were they solved to the entire satisfaction of their originators would do but little towards advancing the best interests of the practical honey producers.

What we most need is, better and more systematic and thorough methods of introducing our honey to the masses whereby they may become familiar with its value and uses, and when once such methods are established and put into practice, the difficulty is solved and the questions of overstocking and a glutted honey market will be no longer "bugbears" or barriers to the aspiring apiarist.

We have but little sympathy with the idea so often expressed by some, that we should discourage the broad and benevolent spirit of love for our neighbor so prominent in the lives and teachings of Moses Quinby and L. L. Langstroth.

We are free to state that the difficulty arises not from teaching apiculture to our brother man, but in neglecting to teach him the proper course to pursue.

When we debar others from the same privileges that we love to enjoy ourselves, we at once create a dangerous monopoly and monopolies are the *curse* of every country and nation.

There are and always will be two classes of beekeepers. The one, the specialist, who devotes his time and attention largely to this industry as a means of support; the other those who keep but a few colonies whereby they may furnish their own tables with pure unadulterated sweets and indeed the best sweets prepared by the Creator as an article of food, or take it up as a recreation or study.

How to establish satisfactory relations between these two classes and the consumers should at present engage more of our attention than any other subject. This can only be accomplished by the plan which for more than two years we have kept prominent before our readers. While individual effort with abundant means will work wonders we *must* have the united effort of the entire beekeeping fraternity. This, and this alone, will produce the desired results.

The beekeepers of New York state are awake to this fact and when, during their last convention they made the Northeastern Beekeepers' Association a state association, elected a vice-president for each county urging upon the beekeepers the importance of forming an association in their respective counties, and appointed delegates who should represent the interests of New York State at the North American convention to be held in Detroit next winter, they struck the key note of success. This *must* become universal and when this example is followed by every state and section of our country, and competent and practical beemasters, who *will* represent the

combined interests of the producers and consumers, are sent each year to our North American convention we can hope for unselfish and satisfactory results.

In order to establish a stable demand for honey, the masses *must* be educated as to its value and uses. To do this there must be a beekeepers xhibit connected with every agricultural fair in the country consisting of displays and sales of honey, wax, and in fact all that pertains to beekeeping together with exhibitions of the practical management of bees in the production of honey, so that the people may become familiar with the methods by which comb and extracted honey are produced. This may seem a hard task; and indeed some of our teachers will suggest innumerable difficulties, but those who take a broad, liberal view of these matters will agree with us in saying that when we are willing to attend conventions for the worthy and commendable purpose of enacting such measures as will bring the most good to the largest number, and forever banish sectional strife and selfish aims, it will be an easy matter to adopt a course by which these matters may be satisfactorily solved. Indeed we think, and experience has taught us, that the masses of beekeepers are ready for advanced ideas and that the reason that we have made no more progress in this regard has been because we have lacked *union* and coöperative effort.

We would urge the importance of reform in association work as the *only* means through or by which we can solve *all* the great questions that are vexing us at present. Let the beekeepers in every state and section awake to the importance of this matter *at once.*

CORRESPONDENCE.

NOTES FROM NORWAY.

Mr. Editor:

I am in receipt of your kind letter of Nov. 24, as well as the numbers for 1884 of your excellent journal.

With regard to your journal it is, according to my conception, the best bee-journal I know. I receive 2 American, 1 English, 1 French, 1 German, 1 Danish and 1 Swedish bee-journal, but none of these can be compared to yours.

As to sending you communications about apiculture in Norway, I will do that with pleasure, though I believe that it will hardly be of any value for your journal, which has so many eminent apiarists as correspondents.

As I am somewhat inexperienced, I can only send you communications about the Norwegian beekeepers' efforts to imitate the first apiculturists of the world—the Americans.

Apiculture here has only been carried on with skeps; some beekeepers have however tried a kind of frame-hive, called the Rinnes, which however has been found less suitable and too small. There have been used also some twin-hives but this hive-form though frequently tried, has not shown itself advantageous. The heath beekeeping may therefore be considered as the only one that has had any progress here: skeps with slaughtering in

the harvest and some few wintering hives.

There was in 1883 constructed by me a hive-form, now generally known as "Young's hive." It has 16×1 and 16×2 standard frames, German standard measure, and this form of hive seems here to be very suitable.

In the brood-room there are 16×1 standard-frames; beyond the same in the super 16×2. Here we only use extracted honey.

With the introduction of "Young's hive," beekeeping seems to have made a very good progress and also therewith that we in June, 1884, formed "The Norwegian beekeepers' association." This meets with general sympathy, and its aim is to promote an apiculture suitable for the circumstances. We had no bee-literature here, only some antiquated small work. I therefore published, in the beginning of this year, a small guidance: Praktisk lommebog i tidsmässig biskjotsel" (Practical Guide for Beekeepers) which I published, using "The Modern Beekeeping."

This book has found a very kind acceptation here, and will as I hope promote apiculture here. I take the liberty to send you, Mr. Editor, a copy of my book, in which you will find an explanatory engraving of "Young's hive," which is undoubtedly a very good wintering hive.

On the pages 45 and 46 you will also find skeps with "Young's side-supers" behind and beyond. This small side-super is a quite thin bag wherein are 6×1 standard-frames. In these side-supers behind, the bees enter by means of a tunnel in the bottom-board, into the super beyond, through a 3 inch hole in the top of the skeps and the super bottom-board beyond the same. This hole is provided with perforated metal. These side-supers have shown themselves very suitable and advantageous, and I have found them suitable as transition to frame-hives.

This winter I try, for the first time, to winter in these and shall be glad, in the coming spring, to let you know the result. We always winter bees on the summer-stands. To preserve the bees against the winter's cold, I use for my small supers double bags of duppel or another thick substance.

I think your readers have for this time got enough concerning the beekeeping here and I must ask you to be indulgent with the language.

Should you after this wish any more, I shall be glad to write you more about our beekeeping.

IVAR S. YOUNG.

Christiana, Norway.

FOUL BROOD IN AUSTRALIA.

Engineer-in-Chief's Office.

MR. S. M. LOCKE:

I have received your letter of Aug. 1, and am exceedingly obliged to you for the information respecting the cause of "foul brood." The answers given in the American Apiculturist were of deep interest to me. Your wish "that Australia may escape the curse of foul brood" cannot be fulfilled, as the disease is prevalent around Adelaide and threatens to seriously injure the beekeeping industry. My hives were attacked at the end of last winter and I attempted to effect a cure by spraying the combs with a solution of salicylic acid. This had little effect and the disease spread rapidly through my apiary. I then adopted Mr. Muth's method of cure, viz., removing the combs and feeding with honey medicated with salicylic acid, and am pleased to say that this was most successful.

In the midst of these operations I received a copy of the British Bee Journal containing Mr. Cheshire's able paper on "foul brood" and its cure, by the use of phenol. I at once commenced feeding, as directed, two diseased colonies and a decided improvement was soon apparent. However, I prefer Mr. Muth's method because the disease is at once stamped out, whereas with Mr. Cheshire's plan a cure is not effected for many weeks. In cold climates the loss of combs and brood may be a serious thing, but here where brood-rearing is carried on all through the year it is a small matter.

I am curious to see what the American writers on bee culture think of Mr. Cheshire's discovery; it appears to me to be very valuable. Foul brood has been the cause of the destruction of many colonies in this country, but at the present time, the disease has assumed an epidemic form and is raging in all directions.

Last September I received direct from Italy a package containing eight Italian queens. On opening the boxes all the queens were found alive, although one died next day. They were cleverly packed and had received no attention from the time of leaving Bologna until I received them (35 days).

With kind regards, believe me,
Yours very truly,

A. E. Bonney.

Adelaide, South Australia,
Nov. 15, 1884.

REPORT FROM MILLEDGEVILLE, ILL.

Dear Sir:

I have taken your excellent journal commencing with the first No. and am well pleased with it. I admire very much your fair way of dealing with all practical questions. You also have an excellent corps of contributors who do not have nonsensical hobbies to ride but deal with facts in a practical way. One other matter of great importance that I admire is the gentlemanly way that the discussions are conducted. Wrangling discussions and personalities are unpleasant and out of place in any Journal, and the "Apiculturist" has thus far been quite free from such, I am pleased to say.

We commenced the season after filling spring orders with 80 colonies of Italian bees (we tolerate no others) and have now 115 colonies in winter quarters in good condition. We winter mostly in the cellar which we prefer to any other place after an experience of twenty-four years in this climate, having tried, during that time, all the different modes that looked at all practicable to us. Our crop of surplus honey amounted to 5,200 lbs., 2,200 lbs. of which was comb. A few of our colonies were used in rearing queens. The season was below the average with us. I wish you a happy and prosperous New Year.

Yours,

F. A. Snell.

BEEKEEPING IN THE SOUTH.

Dear Sir:

Not having time to answer so many individual inquiries regarding apiculture in this locality, I thought it best to answer at once to all through the "Apiculturist" (with thy permission). Black bees can be obtained in middle Fla. in cypress gums also in southern Georgia at from $2.00 to $4.00. Falconer's or Root's Langstroth hive, with Simplicity upper, costs $3.25 complete, at this place. They can be transferred during February.

Natural swarming varies as in most locations according to the condition of your stocks and the amount of spring honey flow, cold and wet weather, etc.; say alternate years, this being the off year, next will probably be one for swarms during March and April. The first honey flow ceases about April 1, for about, say to May 1 to 10, continuing about two or three weeks to June 1, ceasing again to June 15 to 20 and continuing until about July 25 to August 10 ceasing again until Oct., then a light flow until Dec. 1. Artificial increase may be *safely* practised during the second and third honey flow in any year; hazarded in the first, and extra hazardous in the fourth. Few large apiaries are without drones any month in the year except Dec. and January. The large red ant is the "unknown quantity" during the times noted: I have succeeded then only by eternal vigilance, and having my hives placed on benches standing in water with a film of kerosene on its surface; then again, for mating early queens, the mosquito hawk often gets five out of six, which occurs during last of March and through April; last of Feb. and first of March being better than the former for queen-rearing. No surplus to any amount is taken only from the second and third flow, although in some seasons and localities it might be taken from the first and the last flow, but you cannot depend upon it. Robbing is also another factor to be taken into account as there is hardly a day in the year that bees cannot fly, and woe be to the orphans where mother is gone! for then they will fight neither robbers nor moths which are always with us, but to him or her that will do as I have, success will come at last and it will consist in close attention to all the *little details;* and their sum, when from one hundred or more stocks, is then considerable. This way, my friend! We'll get up and wash ourselves before the sun, the dew dripping from the live oaks covering the apiary. The red and mocking birds are singing. We will walk out. I will take this stick with a bit of wire cloth on the end. What for? To rake down all cobwebs built over night, and this brush with which, after first examining any rubbish on the alighting board, we will brush away all dirt, or the small oak leaves that may have fallen on the hives, for all must be clean. Look sharp after wings! Wings? Yes, my dear sir, bees' wings. They show that the ants gave them a tilt last night and will be back tonight in full force and finish up the job, when you must be on hand with your lantern, kerosene and matches, or your stock is annihilated before the sun rises! By the time we have looked at *every one carefully*, there's the breakfast call, and often I have waited in the apiary for all to eat before I could leave until one of the boys or my wife could take my place. Then just before retiring walk around through them without a light, and listen for the cry of distress, which if present you will surely detect after losing fifteen or twenty colonies; and so on day by day through the year and with close attention and the downright perseverance and hard work needed to keep 100 or more stocks in the best shape, with a heavy crop of surplus to care for, and low prices to cheer you, then only can you begin to comprehend the life of a successful apiarist. His time for visiting and attending conventions etc., do not begin to equal yours of the north. You can lock yours up in the earth and then crawl in between the buffalo robes and after the cold jingle of bells hie off to the convention and there coolly discuss them, while we in our shirt sleeves are busy with smoker and

veil. Now, friends, you that have written to me for information and all others desiring it can, I think, from the above draw your own conclusions as to what you can do in the way of managing bees so as to build them here in fall and spring and carry them north for the clover crop. Ten years ago I would have thought it would pay to do so, but, as now I am past forty years, I hardly think it will.

A. J. Goodwin, M. D.

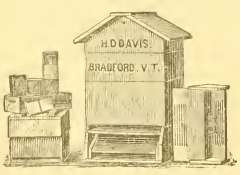
New Smyrna, Florida, Nov., 1884.

THE SAFE WINTERING OF BEES.

Dear Sir:

This is one of the most important topics with which we as bee-keepers have to cope and my success in this regard has been such that it may benefit your readers to consider carefully the following.

In this communication I shall hope to supply some needed information regarding a properly constructed hive and *healthful food* for bees as these are inseparably connected with success in wintering and no art or skill can remedy the defect or mistakes in this particular.



The hive that I use is called the New England No. 7 hive and one upon which I have been employed for a number of years and embodies many and oft-repeated experiments. The hive is constructed in sections; the cap, two sections and the base. The brood-nest is disconnected from the hive being separated therefrom both beneath and at the sides so that it can be removed by hand without any disturbance of the outer case. The space between the brood-nest and the hive is packed during the entire year with buckwheat or India-wheat or dry sawdust or any material that is dry and fine. The object of this packing is to protect the bees from the extremes of both heat and cold. The packing beneath the brood-nest is serviceable during winter in that it inclines the bees to seek the bottom of the hive (which is the warmest part of it) instead of at the top. In this case when the bees drop from the combs they do not die of exposure but finding a place among the cluster are warmed and revived. It is also an advantage to have bees at the bottom of the hive in spring as their being there protects the brood above from the draughts of air.

In my locality the last harvest of honey is gathered from basswood. As soon as my surplus from basswood is properly sealed, I remove it and put a set of extra combs in its place. I then feed *strictly pure* granulated sugar food (in the proportions of four pounds of sugar to one quart of water) until the combs are filled therewith. In preparing this food I pour the water in a boiling state upon the sugar and stir it until it is dissolved. Having these combs filled at this time in the season serves the double purpose of stimulating bees to rear young brood for winter use and also to thoroughly ripen the sugar syrup food which is of the utmost importance. On *no* account should any but an expert attempt late feeding which as a rule is unadvisable and a detriment to the bees.

Before the fall harvest of honey is gathered, I remove these combs filled with sugar syrup food to the storehouse and also lift out of the brood-nest all of the frames of honey that are not filled with brood,

replacing them in the centre of the brood-nest with empty combs or frames filled with foundation. If the bees gather a large quantity of fall honey the bee-master must use his judgment in the matter, supplying room for surplus.

After the colonies have finished storing fall honey and the brood is all hatched out, I remove the fall honey to the storehouse keeping it for another season for the young swarms to use while rearing their brood. In place of this fall honey thus removed I give combs filled with sugar syrup food. Upon this the colonies will feed during the winter. As a final arrangement I lay two one inch square sticks crosswise over the frames to enable the bees to pass from one comb to the other, then cover with two thicknesses of burlap or porous cloth and cover the whole with packing such as has been described to the depth of four inches except over the centre of the brood-nest. Thus fed and packed on the summer stands no colonies need be lost during winter.

In 1882 I went into winter quarters with sixty colonies. In 1883, I had eighty-four colonies and I did not lose one of them. Nov. 15, 1882, I put into the cellar a number of colonies of bees in old hives with movable frames, fed on sugar syrup food (as by my former description). By some mistake one colony was left in the cellar until June 29, 1883, when my little girl informed me there were bees in the cellar; and upon examination I was wonderfully astonished to find the colony in a perfectly healthy condition, lively and no traces of dysentery which was remarkable as the colony which was a small one, had been confined about 224 days and was removed from the cellar when my other bees were nearly through with swarming. It was amusing to see what a grand fly they had after their long winter's repose.[1]

In this connection I would give my method of transferring bees. I do not transfer until late in the fall when the hive is the most free from brood and when I am preparing them for winter. I then drum out the bees running them into a hive containing a set of combs filled with sugar syrup food.

Now, if there be any brood, I cut it out and transfer it into frames placing it in the centre of the brood-nest after which I pack and prepare the bees for winter. There are valuable features in this method. First, you are not obliged to stop during the busy season to attend to this work. Second, as all beekeepers are aware, if the bees are transferred in the spring and the season proves a poor one, while the expert may overcome this and build up in time for winter, yet with the beginner disastrous results are almost certain to follow on account of the bees not properly building up in time for winter.

While I consider *strictly pure*, sugar syrup food, properly sealed, the best thing for winter stores (pure clover and basswood honey free from fall honey are good, but more expensive), yet I would caution my brother beekeepers *never* on any account to allow one ounce of it to be placed in with the surplus honey.

I trust that these few hints may prove beneficial to your readers.

HILAS D. DAVIS.

EXCHANGES.

APICULTURE AND AGRICULTURE, BY T. J. M. (*continued*).— That the nutritive quality of the plants in any growing crop is not diminished by the abstraction of honey

[1] Perhaps those bees hibernated (?) ED]

from their blossoms would appear to be evident from the fact already referred to, that those plants have actually thrown off the honey from the *superfluity* of their saccharine juices, as a matter which they could no longer assimilate. There would appear, on the other hand, to be good reason to believe that the plants themselves become daily *more* nutritive during the period of their giving off honey, that is, from the time of flowering to that of ripening their seeds. This is a point upon which, I believe, all agricultural chemists are not quite agreed, but the testimony of Sir H. Davy is very strong in favor of it. In the appendix to his work already quoted, he gives the results of experiments made conjointly by himself and Mr. Sinclair, the gardener to the Duke of Bedford, upon nearly 100 different varieties of grasses and clovers. These were grown carefully in small plots of ground as nearly as possible equal in size and quality; equal weights of the dried produce of each, cut at different periods, especially at the time of flowering and at that of ripened seeds, were "acted upon by hot water till all their soluble parts were dissolved; the solution was then evaporated to dryness by a gentle heat in a proper stove, and the matter obtained carefully weighed, and the dry extract, supposed to contain the nutritive matter of the plants, was sent for chemical analysis." Sir H. Davy adds his opinion that this "mode of determining the nutritive power of grasses, is sufficiently accurate for all the purposes of agricultural investigation." Further on he reports, "In comparing the compositions of the soluble products afforded by different crops from the same grass, I found, in all the trials I made, the largest quantity of truly nutritive matter in the crop cut when the seed was ripe, and the least bitter extract and saline matter — and the most saccharine matter, in proportion to the other ingredients, in the crop cut at the time of flowering." In the instance which he then gives, as an example, the crop cut when the seed had ripened, showed nine per cent. *less* of sugar, but *eighteen per cent.* more of mucilage and what he terms "truly nutritive matter" than the crop cut at the time of flowering. From this it would follow, that during the time a plant is in blossom and throwing off a superfluity of saccharine matter in the shape of honey, the assimilation of true nutritive matter in the plant itself is progressing most favorably. In any case it is clear that the honey, being once exuded, may be taken away by bees or any other insects (as it is evidently intended to be taken) without any injury to the plant, by which it certainly cannot be again taken up, but must be evaporated if left exposed to the sun's heat.

There is, however, a plea put in by the agriculturist on behalf of his grazing stock, and one which he generally seems to consider unanswerable; he says, "even if it be admitted that the removal of the honey from my farm is neither exhausting to the soil nor injurious to the plants of the standing crops, still it is so much fattening matter, which might be consumed by my stock, if it had not been pilfered by the bees." Now it may at once be admitted that honey consists, to a great extent of fattening matter, though it may be allowable to doubt whether, in that particular form, it is exactly suitable as food for grazing cattle. Although it is quite true that the saccharine matter assimilated in the body of a plant tends to the formation of fat in the animal which eats and digests that plant, still one may question the propriety of feeding the same ani-

mal on pure honey or sugar. We may, however, waive that view of the subject, as we shall shortly see that it is only a question of such homœopathically small doses as would not be likely to interfere with the digestion of the most delicate grazing animal, any more than they would considerably increase his weight. Admitting, therefore, that every pound of honey of which the grazing stock are deprived by bees, is a loss to the farmer, and therefore to be looked upon as a set-off, to that extent, against the benefits conferred by the bees in other ways, it will be necessary to consider to what extent it is possible that such loss may be occasioned. In the first place it must be recollected that a large proportion — in some cases the great bulk — of the honey gathered by bees is obtained from trees, as, for instance, the linden in Europe, the basswood and maple in America, and in this country the forest trees, nearly all of which supply rich forage for the bee, and everywhere from fruit trees in orchards ; a large quantity is gathered from flowers and flowering shrubs reared in gardens — from clover and other plants grown for hay and not for pasture — and even in the field there are many shrubs and flowering plants which yield honey, but which are never eaten by cattle. Pastures therefore form but a small part of the sources from which honey is obtained, and in dealing with this grazing question we have to confine our enquiries to clovers and other flowering plants grown in open pastures, and such as constitute the ordinary food of grazing stock. In order to meet the question in the most direct manner, however, let us assume the extreme case of a large apiary being placed in a district where there is nothing else but such open pastures, and growing only such flowering plants as are generally eaten by stock. Now, the ordinary working range of the bee may be taken at a mile and a half from the apiary on all sides, which gives an area of about 4,500 acres for the supply of the apiary, and if the latter consists of 100 hives, producing an average of 100 lbs. of honey, there would be a little more than 2 lbs. of honey collected off each acre in the year. Or, if we suppose so many as 200 hives to be kept at one place, and to produce so much as ten tons of honey in the season, the quantity collected from each acre would be 4 to 5 lbs. — *The New Zealand and Australian Bee Journal.*

(*To be continued.*)

NOTES AND QUERIES.

—The Cure of Diphtheria by use of Honey : a translation by Arthur Todd.

It is now some time since the malady in a certain region in France carried off many poor children, who had neither doctor nor medicine.

Now, as soon as the first symptoms appear, recourse is had to honey. A good layer of honey is spread upon a piece of thick wrapping paper, and this plaster applied to the throat.

This remedy has had the greatest success ; so much so that, in the villages where it is difficult to call in a doctor, it may be said no more children die of this dread disease.

Philadelphia, Pa.

— At the last meeting of the Northwestern beekeepers' association, a special committee was appointed for the purpose of securing by legislation, laws for the suppression of foul brood, and for securing statistical reports of apiarian products. We would urge

all our readers who can render our western friends the least possible assistance in this matter to take hold with a will, and use such influence as they possess in furthering so worthy an object. T. L. Von Dorn, 820 S. Ave., Omaha, Neb., is the secretary of said committee.

— Just as we go to press the following sad and painful intelligence has come to us from Mr. Chas. Lake of Baltimore, Md.

Died, in Balt., Md., Jan. 23, 1885, Elenora, only and beloved daughter of Chas. and Susan Lake, aged 12 years, 2 mos. and 6 days.

A few brief words, but what father or mother can read them without mingling their tears of true sympathy with the bereaved parents.

Elenora was beloved by all who knew her and her loss will be deeply felt not alone at home but among her acquaintances in the Sunday School and its associations where she was a general favorite.

We would also add that Mr. Lake has been prostrated with pneumonia and has been unable to attend to the correspondence that has come to him of late, but he is improving and as soon as he is able, he will reply. Bear with him patiently; his burden is heavy.

— We are pleased to state that Mr. Arthur Todd of Germantown, Phila., Pa., is prepared to furnish those who need a remedy for foulbrood, with the *absolute phenol* used in the experiments described by Mr. Frank Cheshire. Please write to Mr. Todd for further information.

— The following communication from Mr. P. H. Elwood is so conclusive as to need no comment from us.

Starkville, N. Y. Jan. 30, 1885.

Dear Sir:

I congratulate you on the high compliment paid by the oldest to the youngest American Bee Journal. I refer to the adoption by the A. B. J. of the original and very valuable question department of the "American Apiculturist." This is for publication.

P. H. Elwood.

— Remember that the international Beekeepers' Convention will be held at New Orleans Feb. 24, 25, and 26. A very interesting and profitable time may be expected and all those who can possibly attend should do so.

— Every person who will send five *new* subscriptions at $1.00 each will receive a queen worth $1.50. How many will secure a queen and thus extend the circulation of the "Apiculturist."

— Do not be too hasty in adopting new methods and ideas; test them thoroughly on a small scale before entering into them largely. Heavy investments sometimes give large returns but only too often failure follows unless one makes haste slowly.

— Do not delay preparations for spring and summer work until the season is upon you. It does not pay. Order your supplies early, and remember that if you want good honest work and first-class material, you should *know* with whom you deal. Cheap prices often mean cheap and unsatisfactory goods.

— Never ship to a distant market any honey that you can find a market for near home and use every endeavor to educate those in your immediate neighborhood, as to the value of honey as a food and medicine.

— One of the best preventives of spring dwindling is to keep your bees warm and *not permit* them to

fly when the weather is unfavorable. If you take them from the cellars early and leave them on the summer stands, they should be protected as much as possible from sudden changes in temperature.

Doctors in beekeeping disagree in regard to the advisability of stimulative feeding in early spring; but we think that if a proper style of feeder is used and the bees are supplied with just what thin syrup food they will consume daily, good results will follow, but care should be taken that the bees are not induced thereby to breed too rapidly until warm weather has come.

This advice may be considered premature but our readers in the north will remember that we have subscribers in every state in the Union.

— To be able to ascertain the condition of your colonies without disturbing them too much and too often is a valuable feature in practical and successful beekeeping and something that we too often neglect to learn.

— Some of the pages of our Journal for 1884 were destroyed and had to be reset, hence we have been unavoidably delayed in completing the bound volumes.

—We have just received from Messrs. Chas. Dadant & Son some very fine samples of comb foundation. The heavy for wood comb has a very thin base with high and heavy side wall and the light (or thin) for use in surplus boxes has a base that is thin enough to suit the most critical and there is not an over abundance of wax in the side walls.

—Every beekeeper should remember that if we ever have a staple honey market and fair prices for our honey it will be because each one has performed the duty that devolves upon him as a member of the beekeeping fraternity; and when each one recognizing this fact instead of leaving it for others to do takes hold with a will, there will be a grand union of effort that will make itself felt through our land.

—We learn that Mr. D. A. Jones is preparing for a gathering of beekeepers at his home and Island apiaries some time next summer. Having spent one season with Mr. Jones we can assure those who attend that they may look forward to a pleasant and profitable visit.

BOOK NOTICES AND REVIEWS.

Mr. Ivar S. Young of Christiania, Norway, has kindly sent us a copy of his work on apiculture, the Praktisk lommebog i tidsmassig biskjotsel (A Practical Guide for Beekeepers). We have, as yet, been too busy to review it, but the general make-up of the work is commendable and the illustrations are fine.

We have just received from Rev. Wm. Ballantine, Sago, Ohio, his work entitled "A Practical Treatise on Bee Culture for Pleasure and Profit." This is an interesting and instructive little manual and is fully illustrated. For further information address the author.

CONVENTION NOTES.

NORTH AMERICAN BEEKEEPERS' CONVENTION.

(*Continued from p. 285, Vol. II.*)

WEDNESDAY, OCT. 29.

Convention called to order at about 9.30 with President Root in the chair. The first business was the enroll-

ment of members and it was decided to accept 50 cents as the membership fee for the current year. (The list of members appeared in last number.)

On recommendation of the program committee the paper of Thomas G. Newman, editor of the "American Bee Journal" on "Marketing Honey" was read by the Secretary.

Mr. President and Members of the North American Beekeepers' Society.

I am requested to send you a short article on the above subject, but I shall not attempt to go over the well-defined and oft-repeated rudimentary rules for the management and preparing honey for the markets of the world. These items have been fully discussed at previous meetings, and I have nothing further to add to the views already expressed. But there is one thing that it will be well to discuss, and not leave it there, but to appoint a committee whose duty it shall be to address the railroad companies of America and demand in the name of this society redress in the matter of the classification of bees and honey. Hives of bees are classed at double first-class rates which is very unjust, making the charges equal to those for sending by express. Then by the mistaken use of the word "hive" for colony, empty hives are by many railroads classed the same as those containing bees greatly to the detriment of those who buy hives from manufacturers. They should go as empty boxes at about one-eighth of the cost now demanded for freight by some railroads.

In the matter of shipping honey to market the classification is so high that it amounts to almost a robbery; and to seek relief some beekeepers ship extracted honey as "syrup" at less than half the rates demanded for honey. Tariffs ought to be revised and liquid honey should be rated the same as syrup. Those beekeepers who have a desire to be exactly right and feel delicate about the matter of shipping honey as syrup are therefore compelled to pay double the amount which their less scrupulous neighbors have to pay for freight to the large marts of the world.

Some grades of syrup sell as high as honey and there is no reason why both should not be graded alike when one is as easily and cheaply handled as the other.

Regretting my inability to be present allow me to suggest that you appoint a committee to confer with the different railroad companies and instruct them to endeavor to get these things adjusted on an equitable and reasonable basis.

Mr. Pettit in opening the discussion upon this subject, urged the importance of taking more trouble to induce grocers and others to keep honey for sale, as much more honey would be sold by so doing, and that, in Ontario, honey is put into boxes and glassed on one side, and tissue paper is put on the bottom to prevent leakage.

Mr. Dodge thought that we did not ask a sufficiently high price for extracted honey as compared with comb honey.

Mr. W. E. Clark claimed that the beekeepers were more to blame for the condition of the honey market than the dealers or consumers, and explained that the local market in Oneida County could have been kept at 20 cts. had not a neighbor of his, who had a good crop of honey, rushed it on the market early in the season at 16 cents per pound and broke the market. He had rather sell his extracted honey at 15 cents than his comb at 20 cents, if the honey is extracted before being capped. He advocated holding on to our honey and advised that holders should not all endeavor to undersell each other, thus glutting the market and lowering the prices.

Mr. Betsinger advocated making an effort to secure reduced freight rates, and urged that we take care not to overload the local markets. Last year he saved one-half of freight in shipping honey.

Comb honey will always be a luxury and never come into general use. He would urge the production of extracted honey to take the place of butter, etc.

Mr. Bacon believed that the trouble in marketing honey is that the people are not properly educated and do not understand why comb honey should bring a better price than extracted. He never sold his honey less than 18 cents, but this season another party came in and sold honey for 15 cents, while he was selling at 18 cents.

Mr. Dodge agreed with Mr. Clark that local markets could be built up to a certain extent, but where a beekeeper has 150 colonies of bees and produces 8,000 to 10,000 pounds of honey, he must ship it to the large cities.

Mr. T. O. Peet claimed that extracted honey was not as good as comb honey, unless extracted after it was capped.

Mr. Hall said that the price of honey was beyond the control of the large dealers. He never sold his honey less than 12½ cents wholesale, and 15 cents retail, the purchaser paying for the package. This year he was obliged to cut down to 9½ cents at the door in order to compete with a party who peddled honey for 10 cents, taking pay in potatoes, etc.; but after the party sold out he placed it at 10 cents. Parties who will go wild with the honey should be treated with contempt, as they can neither be controlled or educated.

Mr. Will Ellis said, that the great cause of the fall in prices is that the producers instead of the consumers manage to cut prices by competition.

Mr. Pierce said that he put up his honey in as inviting a manner as possible, and tried to hold the prices at a fair standard.

Mr. Locke then showed a jar having upon it a label "Thurber's best white comb honey, from H. K. & F. B. Thurber & Co., New York." The jar had a glass cover which was so grained that it was impossible to read through it, and upon removal of this was found a notice explaining the contents of the jar which was in all probability placed there for the purpose of satisfying the law. He claimed that the jar contained adulterated honey, and that the label was an evident misrepresentation of the contents of the jar.

As Mr. N. E. Dodge of Fredonia, N. Y., had handed in the question "How and when shall we market our extracted honey?" bearing on the same subject, it was agreed to consider it in connection therewith.

It was moved by Mr. Peet and seconded by Mr. Hall:

Resolved, That this convention recommend to beekeepers the desirableness of taking more pains in placing their honey on the market in the most attractive manner, both extracted and comb honey, and attaching their names thereto, and that they discountenance all efforts to bear down the market by slovenly beekeepers and dealers who adulterate it.

Mr. L. C. Root considered the point made by Mr. Newman regarding railroad rates on honey as well taken, and thought that it would be well to appoint a committee as suggested.

After some talk it was decided to make the vice presidents of the association a committee to consult with the railroad authorities regarding rates.

The meeting then adjourned and assembled on the front steps of the City Hall, where the group was photographed.

FOURTH SESSION.

The convention was called to order at 2 P. M., Mr. L. C. Root in the chair; and at the suggestion of the committee on programmes, reports from the vice presidents were read as follows: O. O. Poppleton, Iowa, Dr. J. P. H. Brown, Georgia, and W. S. Hart, Florida. Mr. W. F. Clark then read his paper on "Wintering Bees." He claimed that at present there was no safe and reliable method of wintering bees, and that we are bee-learners; while every other branch of beekeeping has made wonderful progress during the last twenty years, wintering has been at a standstill. We should pay more attention to the hibernation of bees as, if bees are well provided with shelter and food and can hibernate, they will winter well. He asserted that if we were to give bees a domicile impervious at the top, having side walls, so that the frost will not strike through and condense vapor inside, give them food and supply a perpendicular air column beneath, we shall solve the winter problem. The great desideratum is pure air and plenty of it in a receptacle not too large for them to regulate the temperature. The bees generate their own heat, and if it is wasted they must consume too much food and then they become distended with fæces and cannot sink into perfect quiet which is their normal condition in winter.

Mr. Clark described a hive-stand, a model of which he exhibited. It was so constructed as to give the bees a vertical air-shaft under the hive. He requested each beekeeper present to give his method a trial with at least one colony of bees the coming winter.

Quite a spirited discussion followed the reading of this paper. Mr. Isham asked Mr. Clark if he had ever put his theory into practice and admitted that he had not, but was going to try it this winter.

Mr. Ira Barber gave his plan of wintering as given on page 60, Vol. II, "Am. Api." He also stated that he thought that if bees are fed on coffee A sugar or one kind of food, they will keep quiet; but if they have two or more kinds or a change of food there is a stimulating change produced in the bees which arouses them to their detriment. Sugar food is by all means the best. Allow the bees about twenty-

five pounds of winter stores. Bees do not hibernate when the temperature is above 50°. Bees do not breed extensively when wintered in a warm temperature.

Mr. Hall corroborated Mr. Barber's statements. His cellar is 12 ft. × 12 ft. × 6 ft., and holds 115 colonies of bees. The temperature was not less than 48° nor more than 62°, and the bees were quiet at from 48° to 60°. Last winter he only lost three colonies in that cellar.

Last winter he had another repository under a workshop or dwelling, ventilated through a tube running 150 feet under ground, put in 112 colonies and took out 102 colonies. Nine of the number starved; temperature never under 48° or over 52°.

He had another repository on the "Jones' plan," but could not keep it at an even temperature; sudden changes of temperature make the bees uneasy. He said that Mr. Doolittle in copying Mr. Barber's plan made a failure in using a coal oil stove, which poisoned the bees. Give them a good egress of ventilation instead of an ingress. His bees were put into winter quarters just as they set on the summer stands, excepting that before he places them in the cellar he removes the cushions from the tops of the hives. He allows the colonies about twenty pounds of winter stores.

Mr. C. C. Van Deusen. Bees with me hibernate when considerably warm, but I do not know the temperature.

The next topic considered was the place of meeting, and Detroit, Mich., was chosen by a large majority, and then made unanimous by the convention, after which followed the election of officers as given last month. It was voted that a committee be appointed to fill vacancies in the list of vice presidents, and Messrs. Peet, Vandervort and C. C. Van Deusen were so appointed.

The President, first Vice President, Secretary, Treasurer, and Miss Lucy A. Wilkins of Farwell, Mich., were chosen to be the executive committee for the ensuing year.

A committee of arrangements was then appointed, consisting of Mr. A. B. Weed of Detroit, Mich., Prof. A. J. Cook of Lansing, Mich., James Hedden of Dowagiac, Mich., and H. D. Cutting of Clinton, Mich.

It was then announced that copies of the photograph taken at the door could be had for $2.00 each.

The meeting then adjourned.

THE NORTH AMERICAN BEEKEEPERS' ASSOCIATION.

The executive committee of this association has decided to hold the next annual meeting at Detroit, Mich., Dec. 8, 9, and 10, 1885.

If there is any reason why this date is undesirable it should at once be made known, that the committee may be governed accordingly.

L. C. ROOT, *Pres.*

W. Z. HUTCHINSON, *Sec.*

NORTHEASTERN BEEKEEPERS' ASSOCIATION.

Our experience at the late convention of the Northeastern Beekeepers' Association, held at Syracuse, was most pleasant and instructive. It is gratifying to see that great and important changes are coming over our old system of conducting conventions. One would hardly judge from the pleasant faces and cheerful greetings that beekeeping last season gave poor returns or that the honey market was glutted.

Those present seemed determined to grapple with the difficulties and overcome them and the result will be that hereafter we shall be more united in our efforts.

It has been impossible for us to prepare the reports in time for this number but they will appear next month and here we would state that if, at any time any of our readers should fail to receive their journal, or if they wish other sample copies of any particular number to use, remember that we will, as in the past, most willingly furnish them if you will drop us a postal card to that effect.

ANSWERS TO QUESTIONS IN DEC. NO.

BY A. P. COWAN.

As I take much interest in the short acquaintance I have had with the Question and Answer column, I will answer your questions.

1. 93.

2. Mostly Italians.

3. Doolittle hive with side and top storage and Gallup frame.

4. On summer stand packed in chaff. In Oct. I pack the 5 in. space in each end of the hive, also the 8 in. cap, first putting 3 or 4½ in. square sticks over frames to afford passage for bees from one frame to the other. Usually have covered these sticks with cotton batting quilts or other porous substances.

This winter am trying enamelled cloth closely fitted in as an experiment on a number of colonies. In Nov., I place a box 4 inches larger than the hive, all around over each and pack in and over with chaff, leaving entrance ⅜×14 in. for flight and air.

5. 20 to 30 lbs. I think about ¾ clover; the rest gathered during buckwheat bloom.

6. 3 per cent. latter part of winter and early spring.

7. Plenty of well ripened honey or sugar syrup and so prepared as to keep quiet; pollen does not scare me.

8. Answered in No. 4.

9. No confinement. My bees consume about 25 lbs. as I stimulate quite early by the mixing brood system.

If I have taken too much space in giving answers, cut short, if you see fit to give them a place at all. I make these remarks as I have sent in my report to what is generally termed two of the leading Journals, viz., "Gleanings" and the "A. B. Journal", and have not been able to see them again after sealing myletter and I have read them both pretty closely for the past six years. Perhaps it is because I do not use the Langstroth hive.

Grattan, Kent Co., Mich.

ANSWERS TO QUESTIONS IN JAN. NO.

ANSWERS BY E. E. HASTY.

1. The great variety of hives in use is an evil; but the evil is a necessary one, and arises from the laudable desire for improvement. The attempt to use the public opinion of beekeepers into a despotic power, and ordain a hive that must be used anyhow, can result in nothing but mischief. Gradually the undesirable forms will perish until nothing remains but the last new novelties and a few tried and excellent standard hives.

2. To tell the honest truth on the subject, both to their customers and to all mankind. Here goes a decayed turnip at the head of the man who would have us all put our fingers on our lips and say "S—h!" for fear somebody might be frightened out of purchasing. The most practical remedy is to cultivate direct acquaintance between honest producers and honest retailers. Be enterprising and obliging as well as honest, and nearly every apiary will come to have a large retail trade at its own door.

3. Let him eat it up. Should he decline, I still think it would hardly pay to send him a missionary. Just let him alone. If our craft cannot survive the competition of 20 lb. caps and tin milk pans it must be in a pretty bad way.

4. This question rather mixes me. I hate conventions bad enough, but not for any such reason as here indicated. The Chinese-wall policy of some honey kings may be all right, as far as financial tactics go; but something within me pleads against it. The journals have been careless and done mischief in the past; but they are doing better now, and should have a rest.

5. Not by overstating its medical properties, or by denying that it sometimes causes aches and pains. A little handbill giving a fair statement of the case, and correctly pointing out the adulterated state of other forms of sweet might serve the turn. Distribute abundantly; and give a copy with each package of honey sold. The delicious flavor of honey, and its dainty beauty must do most of the work, by direct appeal to the senses of sight and taste. Get people to notice honey and taste of it, and they will soon want to buy. Let the price be moderate, and you may hope that they will become habitual users.

6. The most important question is, *What kind of a bee is the coming bee to be?*

We greatly need an impartal testing apiary where different races and strains could be subjected to an even test in the hands of a competent, non-interested, salaried keeper. And without fear or favor — every year, and for every strain of bees — a full report should be made, hiding nothing.

ANSWERS BY A. J. COOK.

1. People differ so greatly in taste and judgment, that we cannot greatly

lessen the variety of hives, etc., though there can be no doubt but that a reduction to one or at most to two or three standard sizes and forms would be an immense gain.

That it is possible to devise such a hive as indicated there can be no doubt; that we can prevail upon all to adopt it is a question big with doubt.

2. To do all in their power by precept and example — as I think nearly all now do — to prevent it. Also to secure such legislation as will throttle this ubiquitous demon.

3. Easily; by securing his honey in the nicest shape, and demanding the highest price in the market for it.

4. In my judgment they are all wrong. The whole history of civilization and all progress in every art refute their position. Even sewing machines and reapers had to meet just such an outcry. Apicultural progress is wonderful. It is largely due to what is denounced.

5. By getting it on to every table and in every household in the land.

6. The question of how we may obtain full and accurate statistics in regard to our business. The good of our art calls loudly for such knowledge. Like any other great need, we must and will soon obtain it.

QUESTIONS BY A NOVICE.

1. For successful wintering, why should frames be any deeper than the perpendicular diameter of the cluster occupying them?

2. Can anyone give a scientific (not theoretical) reason, why bees will not winter as well on frames 9½ inches deep as on deeper ones, all other points being the same?

3. Does the depth of a frame have any bearing whatever upon the matter of wintering; if so, what and why?

4. In preparing our bees for wintering on summer stands do we gain anything by removing frames of comb, and putting division boards in their place; if so, why?

5. Taking the bees alone into consideration, is a frame hive any safer for wintering on summer stands, than the old box hive; if so, why?

6. Do the expert beekeepers of today really *know* any more about wintering, than did those of forty years ago?

ANSWERS BY G. W. DEMAREE.

1. I have never been able to see any reasons, either in theory or in fact, why the depth of a hive for any purpose should be greater than its diameter.

2. In my judgment, no one has ever yet given a scientific or a sound theoretic reason why bees will not winter as well on frames 9½ inches deep as on deeper ones. I believe that the facts show that bees winter better on the shallow frames.

3. I really believe it does. On the same principle that a room with a low ceiling is more easily warmed than the same with a higher ceiling, a shallow hive is more easily warmed by the bees than a deeper one. Besides, a shallow brood chamber necessitates a greater length of frame, and this enables the bees to get at their stores by moving with the openings between the frames rather than to have to cross over the frames to get their feed.

4. In this climate nothing is gained by removing combs and substituting them with division boards. A comb makes a better division board than wood. I have never found my bees clustered next to the wood in winter.

5. The old idea that a "bee gum" has no other signification than a mere domicile for bees to live in, still clings to modern apiarists. The idea ought to be exploded. Movable frames in the beehive are implements by means of which the apiarist manipulates and controls his bees. Hence they are not put into the hive for the "bees alone" Looking at the matter in this light I claim no superiority for the frame hive over a well made box, so far as wintering bees is concerned.

6. Modern apiarists have learned how to feed bees when short of stores in winter, and by reason of this knowledge, thousands of colonies are saved now, that would have perished under the care of our fathers forty years ago. Outside of this, little knowledge has been gained so far as the science of wintering is concerned.

In my opinion more bees are coddled to death by the theorists and chaff stuffers, than would die if left to shift for themselves, after the fashion of our fathers of forty years ago.

Christiansburg, Ky.

ANSWERS BY A. J. COOK.

1. In cellar wintering, which I think much the most desirable in our cold climate the form of the frame is immaterial. In the cold spring, when set on summer stands, a square frame like Gallup form, gives most compact brood chamber. Then there are few bees, and must be rapid brood rearing. This requires a warm brood chamber, and I have found it best secured in the square frame.

2, 3. Answered above.

4. Yes, for reasons stated above. We make brood chambers smaller and so the space to be kept warm is lessened. Nothing so prevents spring dwindling as a small close brood chamber.

5. Yes, as we can contract brood chamber.

6. I think *very much* more.

ANSWERS BY E. E. HASTY.

1. The objects of tall frames are to get the bees well above the level of the entrance, and so out of the way of direct draughts of air; also to get the store of honey directly over the bees, so that they can always have sure access to food during long cold spells. Practically, however, the first of these seems to be of very slight advantage if any at all; and the second appears to bring with it a very decided disadvantage.

2. Reasons can be given on both sides; but my experience is that bees on Langstroth frames winter best.

3. Yes, in too many ways to recount in an answer like this. To mention one, if there are three or four inches of solid honey above the cluster frost will collect there heavily during severe weather; and every mild spell this frost will melt and run down among the bees.

4. I have doubts. As there is much less honey to keep in order, the bees do not have to make slop-buckets of their stomachs in so much "mopping up." The extra combs of honey keep much better in the comb-closet.

5. Probably not.

6. Yes. Forty years ago people thought bees became dormant by cold, and ceased to eat. The apiarists of to-day generally *know* that there is much yet to learn — a very great advance. Those of forty years ago strongly inclined to think they knew it all. Although much of our experimental knowledge is in rather a chaotic state just now, order and truth will come out of it. The insinuation that all is nonsense, fit only to be dumped overboard, is a very foolish and mischievous one.

QUESTION BY J. B. HALL.

I would like to ask through the "Apiculturist" of any that have had any experience with Caucasian bees, if they find the queen prolific and the bees as good honey gatherers as other races tried by them."

QUESTIONS BY W. J. RASIN.

DEAR SIR:

I have had a rather strange experience with one of my colonies, the cause of the trouble being a mystery to me, but hope through the medium of your paper and your assistance, to have some light thrown on the subject.

The facts of the case are as follows:

1. About the middle of last October, I obtained an Italian queen from Mr. Alley, and introduced her to a colony which had been queenless about a week. There being no brood left by the old queen, there had been no cells started; but, to be sure of that, I carefully examined every comb at time of introducing the new queen.

2. New queen was apparently accepted as many eggs were found upon next examination, about one week afterwards; the eggs were evenly distributed, one in a cell, so that I am satisfied they were not laid by fertile workers.

3. On January 31, the thermometer stood at 40° Fahr. in the shade, at noon, and 68° on the slope of the hill where the sun shines on my apiary; but did not notice any bees flying from any of my chaff hives, in one of which this particular colony is (No. 8). Having looked at them all at that hour, later in the day about 3 o'clock I happened to see, on the large alighting board in front of No. 8, the queen nearly dead, but apparently from the effect of the cold, the sun having then ceased to shine there, the general temperature of the air being about 40°.

4. After taking the queen into the

house with a few other chilled bees, she, as well as the others, revived so as to be quite lively, but it then being quite late in the day, I concluded to keep them in the house until the warmest part of the following day, when I expected to carefully open the hive and let them run down from the top of cluster.

5. Much to regret the queen and one worker were dead in the cage next morning, which I now believe to have been the result of becoming daubed with some honey I had given them (I have learned one lesson).

6. The queen either *came* out or was *brought* out *alive* by the workers; she certainly was not dead when I found her, so that she could *not have died in the hive* and been brought out dead.

7. The question now becomes, Is this queen the one I introduced last fall, or is she a virgin queen, raised from the Alley queen which the bees may have after all superseded?

This question I hope you will consider of enough importance to have settled by dissection by an expert. I accordingly send the dead queen herewith enclosed. If she was the old queen it may throw some light on the subject of colonies being sometimes found queenless in the spring of the year.

[These questions are interesting and important. We have learned of one other case quite similar to this, but the queen was dead. We have been too busy to make a microscopic examination of the queen as yet; but will answer in our next number.—ED.

☞ The following convention report came to hand just as the Journal was going to press.

SECRETARY'S OFFICE,
NEBRASKA BEEKEEPERS' ASSOCIATION.

Johnson, Neb., Jan. 28, 1885.

ED. APICULTURIST, SALEM, MASS.

DEAR SIR,

I am authorized to send you a report of the meeting of the Nebraska State Beekeepers' Association held at Tecumseh, Neb., Jan. 14, 15 and 16, '85.

Announced by the state papers generally, yet, on account of the extreme cold and stormy weather, but few of the members were present the first day of the session. More came in the second day and with the addition of new members a very interesting meeting was had.

T. L. Van Dorn of Omaha and L. L. Thomas of Plattsmouth were re-elected President and Vice President; W. F. Wright of Johnson, Neb., Secretary, and R. E. Leach of York, Treasurer.

The report made by President Van Dorn and Ex-Secretary, M. L. Trester, of Lincoln, to the Association as delegates to the Beekeepers' Convention at Chicago last fall elicited general discussion.

Mr. Trester read a very interesting paper on an experiment made by him the past year to ascertain at what age bees commence to work. Mr. Trester's paper brought out many facts that were new to most of those present and by resolution he was requested to publish his experiment in the papers of the state.

The form of bill to be presented to the Legislature now in session for their action was drafted expressing the wishes of the Association for a more thorough organization, and for the protection of the beekeepers of the state.

A feeling seemed to exist among the members for such an organization to more fully represent the bee interests of the state, and will without doubt result in the formation ere long of an organization the good effects of which will be felt all over the state, and rank second to none in the "United States" in their line of work.

In regard to the "Hunt Honey Fraud" the executive committee was fully sustained by the association in their opposition to the introduction of adulterated honey into the state by F. H. Hunt of Central Point, Iowa, which has resulted in the removal of such honey from the state.

Honorable M. L. Margraves of Hiawatha, Kansas, was found to be present and on motion was elected Honorary members.

The topics discussed were generally led by G. M. Hawley and M. L. Trester of Lincoln, R. V. Muir of Brownsville, T. L. Whitbeck of Wahoo, J. N. Grant of Beatrice, T. L. Corbett and L. L. Thomas of Plattsmouth, and Mrs. Heuter of Columbus, all old veterans in the manipulation of bees.

By resolution the next annual meeting will be held at Lincoln the second Wednesday of January, 1886.

W. F. WRIGHT,
Secretary

The American Apiculturist.

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HYBRID HONEY SAGES OF CALIFORNIA.

BY W. A. PRYAL.

A writer in the *Kansas Beekeeper* claims that the plant figured and described in several magazines and papers, including some of the bee journals, as the "white sage" is not the white sage, at all; that instead it is a hybrid, being a cross between the black sage and the white sage. The former is the chief honey sage of California, comes into bloom long before the white, and furnishes a good share of the honey crop before the bees work on the latter kind. Comb made of the honey from it is perfectly white and the honey is as clear as it is possible for honey to be.

The leaves of the black variety are of a dark green hue and are rather narrow when compared with the white. On account of the dark color of the leaves it is called the "black sage." It is also called "ball" or "button" sage for the reason that its flowers "ball" round the stalk.

The title "the white sage of California" is known the world around and has so impressed itself because of the famous honey gathered therefrom and which honey takes its name as is apparent from the name

WHITE SAGE.

of the plant. Considerable of the honey thus designated is really not white sage honey but, in a good measure, black sage honey. Still, the distinction does not matter much to the consumer, both are excellent and are "California sage honey."

The flowers of the white sage

plant, says the writer above alluded to, stand out separate and alone on its stem although there are many of them. The plant itself "is magnificent and stately," to quote the same writer again, "and shoots up its tall stems every season, straight as an arrow from the root and growing from 5 to 10 ft. high. Two leaves appear on the stalk exactly opposite each other."

Besides these two distinct kinds there are, we learn from Rev. J. C. Nevin, of Los Angeles, in the *California Apiculturist*, that there are one-half dozen species to be found on the coast.

The hybrid kinds are destined to be much better than the parents. Those that are now to be found wild throughout the southern part of the state are fine specimens of sage growth, and no doubt, by cultivation and artificial crossing with special plants of other varieties which show remarkable and good qualities, some new varieties may be originated which may yet far excel any of the wild ones now found in the sage region.

Exceedingly fine varieties of fruits and flowers have been obtained in this manner and there is not the possibility of a doubt that the same results would lead to some varieties of sage that would not only be a bonanza to the apiarist but also a novelty to the florist.

A short time since I wrote to a gentleman who has manifested much interest in the flora of this state and who has been studying up the class to which the California honey sages belong. Here, let me say that the white sage seed, from which the plant was grown which furnished the subject for the engraving used in *Vick's Magazine* and in *Gleanings in Bee Culture*, was sent to the writer at his instance and request by one of the most intelligent beekeepers in Ventura Co.; that he also obtained seed from another beekeeper of large experience and whose knowledge of flowers was no mean one; that both these persons sent the seed as that of the genuine California white honey sage; that the drawing was made by an artist who understood his work and copied true to nature; that the sketch sent the engraver was correct; that the engraver in transferring it to wood did deviate a *little*, but not enough to change materially the nature of the plant; that the flower is as near like the natural flower as the engraver's art could well make it.

The writer sent seeds obtained from plants grown from seed he obtained from his Ventura correspondent to the gentleman, Mr. A. Norton, already alluded to, and that gentlemen writes as follows: "I did not see the article you refer to in the *Kansas Beekeeper*. I am familiar with white sage, both practically and botanically. Have observed it and all other *Audibertias* closely. Have not seen the plants from *your* seed bloom. But I have several plants a foot high from seed I got of you last year, and can assure you beyond a doubt that yours is genuine *Audibertia polystachya*, or white sage.

Furthermore, white sage belongs to a generic section by itself and is too far botanically different from any other *Audibertia* to hybridize. Also, if it had or would do so anywhere, it would be in the southern counties where three or four species grow together. But no such hybrid, sport or variety is noticed in the 'Geological Survey: Botany,' which is very minute in its way of noticing."

Now, this reliable information upsets a pet notion of the writers; that is, crossing the several kinds of honey sages to produce a new variety. Still, there is a chance of obtaining a sport that may be of merit.

Until the *Beekeeper's* correspondent can produce better evidence than he has, the cut in *Vick's Magazine* must be accepted as a representation of the *true* white sage.

No. Temescal, Cal.

AFTER-SWARMS, ARE THEY PROFITABLE?

By G. W. Demaree.

Perhaps much depends on locality, honey resources, etc., as to whether after-swarms can be made profitable even when increase is desirable. In a location like my own, "after swarms" have always cost me in way of foundation, winter stores, etc., as much as they are worth. I think, however, if we are willing to buy increase, we may as well obtain it in this way.

I commenced at this place with just one colony of Italian bees, and by allowing but one prime swarm as a general thing, I built up an apiary of fifty colonies and made them pay a profit on the investment all the time. I found out when it was too late to profit by it, that I should have found it more profitable to go more slowly, by suppressing all but first, or prime, swarms.

When my apiary was built up to fifty colonies, I began to see the necessity of suppressing increase, and I began to test all the plans given to the public by experienced bee masters.

One season I "cut out queen cells" till I was positively sick of the job, and got a lot of inferior queens as the results. Next, I tried the plan of giving the parent colony a *mature* queen cell, after removing the cells which had caused the swarm. This did not prevent other cells from being started, hence the after-swarms, as a general rule, would come a little in advance of the natural time, that is all.

Well, I next commenced to weaken the swarming colonies by removing frames of brood from time to time, and substituting therefor frames filled with foundation. This suppressed the swarming fever, and "suppressed" my honey crop also, and I dropped it.

Other methods were tried with unsatisfactory results, till along came the "Heddon plan of preventing after-swarms." I took to it quite naturally, as a drowning man will catch at straws, and after trying it, I found that in my

location it would give about the following results: one colony out of ten will cast an after-swarm in the usual way, except that the swarm will be smaller than usual; one-fifth of the swarms will "swarm" by reason of the relay of bees from the parent colony. One colony out of ten will "lay out" and "sulk" away the best of the honey season, while nearly all of the parent colonies are too nearly exhausted to do any good in way of surplus honey.

The rest of the swarms will "work like a charm," and the work we had to do, to perform the divers manipulations to carry out the schedule, was any thing but "charming." Well, the Heddon plan in our location, like the others, was found a "vain hope."

By this time my apiary exceeded one hundred colonies, and I began to get desperate, and to have visions of the brimstone pits.

If my judgment is not seriously at fault not one honey producer in ten can find sale for his surplus bees at a price that will cover the cost of hive foundation and winter stores. As long as this state of things exists, some reliable method to suppress increase will be a great desideratum.

After trying many experiments, I believe the cheapest and most satisfactory way of preventing after-swarms is to pinch the cells which cause the swarming, immediately after the swarm issues, and turn loose among the bees a virgin queen from one to four days old. This plan is not "new," it is only the application of a little sound philosophy. Bees never start queen cells in the presence of a virgin queen over one day old, if they have accepted her. It is this starting of queen cells that does all the mischief.

To prevent swarming altogether, my new system of dividing the colony in two divisions, employing the queenless divisions to produce the surplus honey, and the parent division to produce bees, reuniting them as soon as the swarming season is mainly past, will answer the purpose to perfection. But more time is needed to ascertain if the plan is altogether practicable.

Christiansbury, Ky.

ON THE ORIGIN OF THE CELLS OF THE HIVE BEE.

By Arthur Todd.

The cell of the hive bee has for many centuries called forth the wonder of naturalists and indeed of all observers.

Why should, or how should, so comparatively humble a creature, in the construction of its comb, select that precise form which offers the greatest economy of form and material?

Granting that the bee possesses no inconsiderable share of intelligence, we can scarcely conceive of her having made sufficient progress in the higher mathematics to select knowingly the precise angles which are best adapted to the object in

view. Hence, not a few writers, even to the present day, maintain that we have here a typical case of "instinct" in the old acceptation of the word—that is, of blind unconscious, untaught action, producing results which man can only reach by dint of highly cultivated reason.

So many of these so-called instincts have lately found a scientific explanation that naturalists of the old school have recognized the cell of the bee as one of their last entrenchments.

It is therefore very satisfactory that Herr K. Mullenhoff has found a quite simple and satisfactory solution of the question, which neither admits of any mysterious instinct nor, on the other hand, credits the bee with the knowledge of the differential calculus.

Taking first a preliminary view of the case, we find that Pappus fifteen hundred years ago, noted that bees constructed their cells in the form of regular six-sided columns, and proved mathematically the superiority of this shape to any other.

In the last century Maraldi, and after him Réaumur, examined the form of the middle plate of the entire comb, *i.e.*, the bottoms of the cells, formed each of three rhombs.

At the instigation of Réaumur the mathematician König, in 1739, found by calculation the most suitable, *i.e.*, the most economical, of all possible forms for the middle plate, and ascertained that it must consist of pyramids formed by three rhombs having at the apex the angle 109° 28′. Maraldi had found this as the very angle actually employed by the bees.

These investigators show that each cell represents a six-sided column bounded at the middle plate of the comb by a three-sided pyramid. The edges meeting at the deepest point of the cell form angles of 109° 28′; other angles of the same magnitude are enclosed by the short side of the hexagonal column and the two adjacent sides of the rhombs. In the terminal points of the long sides of the prism there meet therefore, four edges at angles of 70° 32′.

The arrangement of the wax plates which compose the entire comb may therefore be formulated as follows:

1. On one edge there intersect each other each time, three films, and these form with each other equal angles of 120°.

2. At the terminal points of the short sides of the prism meet in each case four edges at angles of 109° 28′.

3. In the terminal points of the long sides of the prism four edges cut each other at 70° 32′.

These properties correspond almost exactly with the laws which Plateau has discovered for his equilibrium figures, namely: at a liquid edge there intersect each other never more than three films, and these form with each other equal angles, and when liquid edges intersect each other in the interior of the figure they are always four in number, and form with each other equal angles.

Cells of exactly the same arrangement and the same angles as the cells of bees are obtained if numerous soap bubbles of equal size are suspended in two parallel frames, and if the two systems of bubbles are approached until they touch each other.

The soap-bubbles flatten themselves, and form hexagonal prisms, terminating in Maraldi's pyramids at the meeting-points of the two systems. The uppermost row of bubbles(that attached to the frame) would take the form of five-sided pyramids, *i.e.*, the exact form of the cells which are attached to the wood work.

The conclusion is, therefore,very natural that this absolute agreement in the respective forms of the soap-bubbles and of the bees' cells depends on similar physical conditions in the construction of both.

If we observe the bees when building their comb, we find that, underneath the board to which it is attached, at least a dozen bees are clinging on each side, in such a manner that the heads of the bees on one side of the comb are exactly opposite to those on the other. As each bee, holding a ball of wax in its jaws, presses as far as possible upwards and forwards, the ball is converted into a plate by the pressure from both sides. At first this plate is not level, but is bent up and down corresponding to the pressure of the numerous heads of the bees. As the bees press forwards, the heads, as they meet, must always make way for each other in the direction of the least resistance : that is, in a newly begun comb a bee on one side is pressed downwards by its two competitors so as to come with its head exactly in the middle between three who stand opposite.

As each bee on the one side presses with its head into the space between the three coming to meet her, there is formed, by the pressure to which the soft wax is exposed, the middle plate so much admired on account of its "highest purposiveness."

The pyramids of Maraldi are merely Plateau's equilibrium figures extended between the terminations of the sides of the prisms just commenced.

The "instinct" that the bees display is very simple ; they press on with their wax upwards and forwards in two perpendicular layers ; of a skilful treatment of the wax there is no trace.

The Maraldi pyramids are formed purely on physical principles, not by the conscious activity of the architects.

The form of the head of the bee has no meaning as far as the shape of the bottom of the cell is concerned, since, in consequence of the high temperature produced by the respiration of the bees, and the continual pressure, the wax is plastic in a high degree.

In an analogous manner the sides of the prism are also produced by the pressure which the cylindrical body of each bee undergoes from the six bees arranged around her on the same side of the comb.

The process is exactly as when

cylinders of equal thickness are formed into six-sided prisms by an equal pressure.

It appears that the procedure of each single bee is exactly the same as if she wished to construct a hollow cylinder. In fact if we give them a thick cake of wax they bite, and press in it round holes.

When they work with an excess of material, as is often the case in the cells of drones, each single cell is a cylinder with a hemispherical bottom. If, in such cells, which resemble test-tubes, the excessive substance is removed, the walls, both of the prisms and the pyramids, gradually take the usual form.

On an examination of a royal cell it appears, also, that the individual bee understands merely how to construct a hollow cylinder with a hemispherical depression at the end.

The fact that the bees frequently and without any perceptible order gnaw holes into the outer wall of the thick mass of wax of a royal cell which naturally turns out hemispherical as the counter-pressure on the opposite side is wanting, shows that their artistic skill does not take a high rank.

When the cells are filled with honey or with full-grown larvæ, they are hermetically closed with a lid of wax. The covered cell has then, as appears from numerous measurements, the exact form of the soap-bubbles above mentioned.

The cells of the "*Melipona*," and those of single combs, are also quite similar to soap-bubbles.

The detached "honey-pots" of the *Melipona* are globular, like a freely suspended bubble.

If two such cells touch each other they become flattened at the point of contact.

Three such cells, if sufficiently close together, take such a form that their planes of contact intersect each other at an angle of 120°.

If numerous soap-bubbles of equal magnitude are arranged in a single plane they approach the form of wasps' cells.

The phenomena of cohesion in the paper of wasps' nests differ entirely from those of water and of wax, and produce a dome-shaped cell-bottom and cover.

If a stratum of soap-bubbles is suspended vertically, and is brought in contact with a second similar stratum, the form of the ordinary double comb of the hive bee is produced.

The agency in the formation of these kinds of cells is to be sought not in a skilful movement of the jaws of the insects but exclusively in physical causes.

These are, in the case of wax, that the plastic and viscous material—just as is the case in soap-bubbles—gives way until a given space is enclosed by a minimum of surface.

Hence planes are formed like those of Plateau's equilibrium figures. The shape of the cells can no more be sought in the bodily structure of the bees than in their architectural skill.

In view of the plastic character of the material, and the manifold impulse to change of form connect-

ed with life in the hive, the cells must soon, if equally arranged, take the form of six-sided prisms terminated by Maraldi's pyramids, even if the bees had globular or conical bodies.

Here Mullenhoff is rather inclined to assume that the general bodily form of the *Melipona*, the bee and the wasp, has been modified by the arrangement of their cells.

NOTE In connection with the soap-bubble experiment to demonstrate the origin of the cell of the hive bee, as exhibited at Syracuse, I send you this paper as it appeared in the "Journal of Science" for 1883 as deserving the attention of your readers.—A. T.

WINTERING BEES.

BY L. C. ROOT.

THE month of January has been very changeable. The first half of the month averages much milder than is usual in this latitude. Such seasons, I find very unfavorable for successful wintering of bees, particularly in rooms above ground which are subject to greater changes of temperature with the variations of atmosphere outside.

I have never had bees leave the hives as much during the month of January as they have this season.

From room A, I took three pecks, and from room B, one half bushel. The stocks weighed, Feb. 1st as follows: No. 1, 79½ lbs., No. 2, 49¾ lbs., No. 3, 60¼ lbs., No. 4, 90 lbs., No. 5, 37 lbs., No. 6, 106½ lbs., No. 10, 48 lbs., No. 11, 53 lbs.

Temperature in room A varies from 40° to 50°. In room B, from 35° to 55°.

Mohawk, N. Y.

A GUIDE TO THE BEST METHODS OF BEEKEEPING.

BY J. L. CHRIST.

R. F. Holterman, Translator.

(Continued from p. 30, Vol. III.)

WHETHER THE BEES ARE SITUATED THE BETTER HIGH OR LOW.

THE question suggest itself if the bees are situated better high or low? For manipulation of the hive, placing under, dividing, etc., it is certainly more convenient when they are situated near the ground, but they should not be less than two feet from the ground. High up, the bees are also, very well placed; and one may, if he has otherwise no appropriate place, let them fly from the roof of a house or the upper story, if one wishes to arrange it for that purpose. They must then not be allowed to swarm; there must also be no jarring work done in the house.

OF THE COVERED HIVE-STAND AND ITS USE.

I am now about to treat of the bee-stand itself, which should be particularly taken into consideration; a well arranged bee-stand is of great use and profit for the bees themselves as for their dwellings. One can, of course, let these stand separate, and for that purpose oaken or cedar posts, particularly the latter, should be charred at the end which is to be put in the ground so they will not rot so soon. These posts put in the ground should have upon them two boards

grooved, or one broad board; then also each colony must have a separate roof, which will keep all water from the bees. If care is not taken about this, the violent rains cannot be kept off, which not only flood it, but dampen the alighting board, which latter board every colony should have. The sun shining upon the damp board warps it and it requires to be repainted oftener, and in winter it easily becomes mouldy; also the hives and stands cannot last nearly as long as if they were entirely sheltered and always remained dry. Irrespective of these, if the bees stand in the open, they will in the height of the summer, at noon, be hindered in their work; even if they do not work with full zeal at this time in the field owing to the strong rays of the sun. One can always notice a difference between those sheltered and those not at this time; the former work with greater energy. Again, the weaker colonies, if on isolated stands in the winter, have less shelter from the extreme cold than as if they were in an enclosed bee-stand. I speak only of colonies somewhat weak (as they are not always alike in strength, the cause for which we cannot always give the reason but can only surmise) for a colony strong in bees and with a sufficient store of honey can stand the severest cold of our climate without injury.

Honey is well known to be of a heating nature, for which reason it can also not freeze; and the bees, which cluster more towards the centre of the hive as the temperature falls, make during the severest cold, partly through radiation, partly by their hum (for the greater the cold the more a strong colony will hum), such a warmth and moisture that in a glass beehive the upper glass, with which it is covered, will be full of large drops of moisture. The four glass walls will have the moisture frozen over like the windows of a dwelling house and this will do the bees no injury.

Yes, I have even in the middle of winter, in January, with various honeys and strength of colonies, found honey running out of unsealed cells and out of the hives so that I have placed small vessels to gather it. This happened as early as September in the year 1777 when a strong honey dew came, from which the bees carried in much but did not seal it over, partly because they could not build any more so late in the season, but partly and mainly because the cells were not quite filled. Their custom is to put in the upper cells first and so on downwards putting a little in each and sealing only as they fill which they do at the top first. As this honey from the September honey dew was not sealed it fell out in drops as large as pease owing to the heat and moisture from the bees.

Although the cold affects the honey and strong colony so little, it is important that the weak should be protected from extreme cold.

To carry such, however, into houses, chambers or rooms, is not only troublesome, tedious and dangerous but not advisable, but they are best on covered stands made as before described.

Rodheim, Germany, July 25, 1783.

(*To be continued.*)

EDITORIAL.

"Coming events cast their shadows before," and the warm sunshine with which the month (Feb.) closes reminds us that soon our little pets and industrious workers will sally forth into pleasant fields; and, by their merry hum, remind us that their wants must be attended to. All of the supplies should have been ordered ere this; but if not, no delay should be made now, if you want to take full advantage of the honey flows, as they come.

While it is true that the past season was not, as a rule, a profitable one, the honey market being glutted, and prices for honey depreciated, yet this should not discourage you to the extent that you neglect to take full advantage of the coming season.

The beekeepers have learned one lesson that will prove a valuable one; that is, not to depend too much on commission men. While many of them do their part faithfully and well, yet they cannot find markets for the honey from the entire country, in the few centres to which it is all shipped.

When the beekeepers realize this fully, and see that through our county, state and national beekeepers' associations, together with their own individual efforts, they can easily dispose of many times the honey that they now produce, and at far better prices, one of the great problems will be solved.

One great trouble is the lack of individual and collective interest, and coöperation in this work. We are far too liable to leave to our neighbor the work that we should do ourselves, and in nearly every instance where this is done but little is accomplished.

It is our candid opinion that, within the next few years, great and beneficial changes will come to beekeeping. Stubborn facts have shown us that the overdrawn, and too highly colored pictures of the profits of beekeeping that have been painted, in order that the beekeepers might be induced to purchase goods, are being destroyed and we of to-day realize that, while beekeeping as an agricultural pursuit will yield good returns for the amount invested (provided the apiarist is a thorough bee-master, and willing to work hard), yet it is entirely unjust to the community to urge those, who are always looking about for some more easy and speedy method of "getting rich," to embark in beekeeping with the expectation of large profits and small outlay. Our endeavors always have been, and always will be, to urge the importance of paying more attention to the proper method of teaching apiculture to the masses,

and our motives have been too often misjudged because we claimed that we could not depend upon the dealer in supplies, who published journals, to give these matters proper attention.

If those of our readers who are acquainted with the literature of apiculture, will look back and review its history, they will find, in far too many instances, that the great object has been to dispose of beekeeping supplies, regardless of other and greater interests.

Can we justly ask those who are dependent upon the sale of those supplies, to state facts through these journals that would curtail, and perhaps injure their supply business?

No! and in view of this, it is plain and conclusive that the good times, and the relief that comes to apiculture, must come through a medium that is *free* to speak frankly and openly any *truths*, that should be made public.

In order that such a medium exist, each beekeeper *must* become individually interested in it. It cannot stand alone, and must be supported by the united efforts of the entire beekeeping fraternity.

For over two years we have shown through the "APICULTURIST," that there could be a journal published, that would fully represent the welfare of those whose interests are involved.

The work for which this journal was instituted is only just commenced. We have rich treats in store for our readers, and valuable plans to put in operation; but this takes funds, and while our subscription list is steadily increasing, yet we want our readers to take hold just as though they realized that the work was their own, and help to increase our list.

In order that you may be remunerated for this, we have made some very liberal offers and if you wish, we will send you some of our little "Companions," for distribution among your neighbors.

We feel at liberty to urge you to help us in our work (by obtaining subscriptions), because we, in return, are devoting our whole time and attention to your interests.

But we would not neglect to advise our readers, regarding the coming season's work. Remember that the less you handle your bees, and yet accomplish all that is necessary, the better will be the results.

While it is advantageous to stimulate bees at a proper time, and in a proper way, yet it is not advisable to force them to breed too rapidly, before they can fly without too much loss; also we are liable to have extreme changes in early spring; and if there is more brood than the bees can care for, it is liable to be deserted and chilled, which is disastrous.

In all the management of our colonies, we should follow as nearly as possible the natural laws which govern the bees, and their habits, and only diverge from them, when absolutely necessary.

Just as soon as convenient, clear up around your colonies (if they are on the summer stands) and

see that they do not become damp or mouldy.

When it becomes warm enough to examine your bees, every comb that cannot be covered and utilized, should be removed; and after the brood chamber is arranged properly, the bees should be so snugly packed that they will keep warm and dry.

Where you are obliged to remove colonies from the cellars, remember, that after having a good fly, they must either be returned to the bee-house, or cellar, or else snugly packed on the summer stands; because if this is not done you will, as a rule, experience severe spring dwindling.

Do not disturb the bees that are in the bee-house, or cellars, so long as they remain quiet, and do not appear uneasy, even though the temperature rises some in the cellars.

The strength of your colonies, when the working season comes depends largely on your care, in their management, at this season of the year. When purchasing supplies remember that the *best* goods bring the best results, and first-class goods, as a rule, come from those who try to sustain a fair price for them. Do not suppose for a moment, that those who advertise to do the cheapest work will give the best attention to your orders.

It is better to unite all weak colonies, and keep a smaller number, having them all strong, than to attempt to doctor and nurse up a number of weak ones.

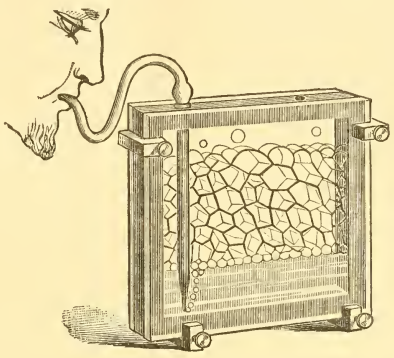
Attention to the smallest details of any business will insure success, when loss will surely follow, if these are neglected. We would urge our readers to come to us with all their difficulties, in the management of their apiaries. It is our greatest desire that you may learn to look upon the "APICULTURIST," as your Journal, and a part of your property—for it is only when you do this, that we shall be enabled to carry out the many interesting plans that we have formed, and intend to carry out.

We have been unavoidably delayed in completing Vols. 1 and 2, but shall send them out soon. If you could realize how arduous our duties have been, and how many difficulties and perplexities we have had to surmount in order to give you the journal that we have, you would become even more deeply interested in its welfare than you have been. Whatever of success comes to us brings great good to you. The only reward that we ask in return is, that you put your shoulder to the wheel, and stand by us in our efforts.

EXCHANGES.

HOLMAN'S NEW ILLUSTRATION OF CELL FORMATION, BY JOHN M. CHILD, A. M.— MR. D. S. Holman has devised a new illustration of great simplicity and beauty, whereby the method of the formation of cells in vegetable structure may be conveniently shown to an audience. The apparatus consists merely of a tank, which is formed by two pieces of plate-glass, held apart at the bottom

and sides by a rubber strip and kept in place by four clamps. In this tank is placed a portion of a soap solution, which is raised in bubbles by a current of air blown into it through a fine glass tube. As the bubbles are formed, their tendency to become spheres in virtue of the force of cohesion in their



liquid walls is overcome by the capillary attraction of the sides of the tank. By consequence the films extend across the tank perpendicular to the walls, and the pressure of one bubble upon another causes the formation of polygonal forms, analogous to those that we see in cross sections of wood fibre. The accompanying figure gives an idea of the appearance that the tank presents when thus filled with bubbles, but does not and cannot portray the beauty of the projection of it which may be made upon a screen. The pencil of rays passing from the condensing lens of a stereopticon is convergent; and as a consequence many rays fall upon the soap films at such a large incident angle that they are almost entirely reflected, and so are tinged with the rich colors resulting from the interference of rays that fall on thin films.

We thus have before us a proof of the tenuity of a layer which is between the limits of $\frac{1}{17000}$ and $\frac{1}{15600}$ of an inch, the latter limit being reached when the color of the film disappears.

The same illustration also affords us an exemplification of the principle, shown in nature in the structure of the honeycomb, that the pressure on each other of equal circles produces an hexagonal structure. Where, in consequence of the regularity of the current of air, we have produced bubbles nearly uniform in size, we notice that the polygons formed are six-sided, and that those of a different number of sides exist where there is a diversity in the size of the air masses.

Friends' Central School, Philadelphia.

NEW OBSERVATIONS ON THE NATURAL HISTORY OF BEES.[1]

By Francis Huber.

The translator's preface states: "The whole of Huber's memoirs are here presented somewhat in an abbreviated form, particularly the portion relative to anatomical details, the theory of respiration and the architecture of bees.

All the substance however is preserved and the narrative is rendered as explicit and concise as the subject admits.

Edinburgh, 1821.

PART I.

LETTER 1.

ON THE IMPREGNATION OF THE QUEEN BEE.

Sir: as you desired me to transmit a written detail of my principal experiments on bees, when I gave you an account of them at Genthod, I hasten to extract the following observations from my Journal.

Nothing can be more flattering than the interest you take in my researches; therefore permit me to remind you of your promise to suggest new subjects for investigation.[1]

Glass hives, constructed after M. de Réaumur's principles, are of a form unfavorable to the observer; because their width allowing the bees to build two combs parallel, whatever passes between them, is concealed from his view.

Long experience of this has induced you to recommend hives much flatter or thinner; the panes of which should be separated by so small an interval that only a single row of combs could be erected between them.

From having felt the same inconvenience I have profited by your counsel in providing hives reduced to an inch and a half in width, wherein swarms have been established without any difficulty. Here, however, the charge of constructing a single comb must not be committed to the bees; they are taught by nature to make more than one, and all parallel to each other—a law from which they never derogate, unless when constrained by some particular arrangement.

Therefore, if left to themselves in these flat hives which cannot admit of two combs parallel to the plane of the sides, they will form several small ones perpendicular to it; and in that case all will be equally lost to the observer.

Thus previous dispositions become essential for the direction of the combs. I so contrived that, while they were built perpendicular to the horizon, the lateral surfaces should be three or four lines from the panes constituting the sides of the hive.[2]

This distance, in allowing sufficient latitude for the motions of the bees, prevented them from collecting in too large clusters on the surface of the comb.

By such precautions, they were easily established in very thin hives where they pursued their labors with the same assiduity and regularity; and every cell being exposed to view, none of their proceedings could be concealed.

It is true, that by compelling these insects to live in a habitation where they could construct only a single row of combs, I had, in a

[1] All the letters in the first portion of the work are addressed to the celebrated naturalist M. Bonnet, whose labors in this department of science are well known, and justly appreciated.

His decease in 1793 during the prosecution of the author's experiments explains the reason for dividing the volume into two parts.—T.

[2] The different measurements are expressed in lines, of which 12 are in an inch.

(*To be continued.*)

CORRESPONDENCE.

NEW YORK AND FLORIDA.

DEAR SIR:

There is no one thing in the science of apiculture that has demanded more attention than that of successfully wintering our bees. What we should call successful wintering is to have them come out in the spring with brood in all stages in two combs at least and no less in the number of colonies.

Colonies in such condition will withstand the sudden changes of spring with no apparent loss.

This is our ideal of successful wintering which, as yet, very few if any have ever been able to attain.

Our experience in New York State in wintering bees has been accompanied with a yearly loss of from five to fifty per cent, besides the poor weak things we are obliged to call "colonies" to keep up appearances. One great reason for this loss is the very short season we have in which to prepare our bees for the coming fall and winter. The early part of the season is spent in building up our colonies preparatory to the honey harvest, regardless of our queens and only too soon fall comes on finding us with poor queens in our colonies: the result being poor wintering and worse springing.

It is a very natural conclusion of the apiarist that if he could move his bees, before cold weather came, to some warm climate and there prepare them for the abundant honey flows that we have in New York, by superseding old and poor queens with young and vigorous ones, he could double his number of colonies if successful and get surplus enough honey to pay. Certainly a fascinating theory which remains to be put into practice.

Our bees here in southern Florida during the month of January have been almost idle as we have had a very wet month of it. I have taken three observations daily of the temperature during the month at 7 A. M., 1 P. M. and 8 P. M. Average temperature at 7 A. M., is 55°, at 1 P. M., 78°, and at 8 P. M., 54°, greatest variation during the day, 38°.

It was so damp and cold that I could do nothing with the bees except to see that they had honey, and keep them as quiet as possible.

At this date old bees are nearly all gone (taking up land for oranges probably) and the queen is reluctant in spreading brood over more than the two combs which were occupied in December.

I think that in my former communication I spoke of the surplus pollen that was being stored; they have used it up during the past month and now gather about what they use. It seems surprising that so little is known of advanced beekeeping in a country where there are so many natural advantages. I transferred a colony from a cypress log on February first, and found the comb so full of honey and pollen that the queen could not do justice in keeping up the numbers of the colony.

That is one great difficulty here with bees in log-gums and the tall box-hives which are used extensively. The bees crowd the brood nest with honey so that the queen is found to occupy small patches of comb, when if the honey was removed they could cast much larger swarms.

The natives in removing the honey pry off the top; cut out what can be reached handily and fasten on the top leaving the bees to build up again. It is no wonder that the southern bee has the name of being *indolent* or *idle*, but it is not the fault of the bees.

Orange trees, under the more favorable circumstances, are com-

ing into bloom. The general bloom will not appear until the last of February or first of March. Our saw palmetto, which promised so favorably in January, has come to a standstill owing to the continued damp spell. Its huge brother, the cabbage palmetto, blooms later and furnishes the most abundant and the finest honey produced in the state.

I hope to be able to give some information in regard to the value of orange blossoms as a honey-producer. I have fed a few colonies in order to see if there is any marked difference in brood rearing which at this date is in their favor.

Feb. 1, 1885. C. G. FERRIS.

IS BEEKEEPING PROFITABLE?

ED. AM. APICULTURIST:

In most of the works on "Bees" that I have read, beekeeping is represented as being "a fair business in which to embark. You cannot mention any business that is so convenient and desirable as an occupation, etc."

The usual history of bees, descriptions of queen, drone and worker, the author's reversible, single, duplex and quadruplex hive (from one of which an enormous yield was taken in 18—) and G. M. Doolittle's report for '77 are innocently dovetailed in. Then the question "Who should keep bees?" is asked and echo answers "Everybody." In estimates of profits I fail to note any charge for services of the owner or his assistants or for the depreciation in value of utensils, etc. In other occupations before any profits are arrived at, the salaries of the various officials are charged as is also the estimated amount of depreciation in value of stock, tools, etc. For instance, let a man purchase a schooner say for $20,000. This vessel will rot down say in ten years. Should she net the owner $2000 per annum over her expenses, then at the end of ten years he would have his $20,000 back but no profits on the investment and he would be out a large amount of interest. Bee houses, clamps, hives, frames, extractors, foundation mills, etc., also depreciate in value and as this point is not generally touched upon I would beg leave to ask through the "Apiculturist":—

1. Charging fair salaries for work done, for necessary expenses, and for depreciation in the value of accessories, does beekeeping pay?

2. If yes, then suppose a specialist having a fair field for operations where basswood is fairly plentiful, say on some line of railroad where his apiaries could be located about every four miles and running them say for extracted honey at 10 cts. per pound, how many colonies would he require to have to ensure him an average salary of a first-class clerk or say from $1000 to $1200 per annum over and above expenses and depreciation?

3. How many assistants would he require to have during the honey yield to operate these colonies successfully?

4. Given a first-class hive and fixtures, how many colonies could one man examine and extract honey from in a day of ten hours hard work?

5. With proper assistants how many colonies run for extracted honey could one apiarist successfully oversee?[1]

Apistically yours,
APIS CANADENSIS.

Kingston, Canada, Jan. 24, 1884.

[1] Will some of those who have had experience in these matters please send answers to these questions for our next number?—Ed.

NOTES FROM CALIFORNIA.

ED. AM. APICULTURIST:

DEAR SIR,

It is now an established fact that California is always going to have control of the honey markets of the Pacific slope and the islands of the Pacific. Possibly, during an occasional dry year she may not be able to place sufficient honey in some cities, and consequently some may have to be brought from elsewhere. Still, on account of the cold climate and excessive rainfall in Oregon and Washington Territory, these places will never make any great strides apiculturally. Those who have tried bee-keeping for profit in the Web-foot state and in the Territory are, in the majority of cases, and in the remainder are well nigh, fit subjects for the column of despondents. The apiculturists of California have good reason to feel grateful for their success financially and otherwise although during the past year they had to battle against low prices. Prices will not always be low. The wheat-growers of the Golden State were well nigh on the point of abandoning the plough, reaper and thresher; for, as is well known, wheat took a tumble and quite nearly if not really broke up many of the farmers who devoted all their land to wheat-growing.

The culture of fruit seems to be the main stay with those who wish to make anything out of the soil; thus many farmers who see a gloomy future for wheat-growers have begun to devote some of their land to such use and intend to extend the limits of their orchards every year.

The climate of the state is admirably adapted to fruit culture and all fruits are to be found flourishing here.

The prices range at a figure that warrants the fruit culturists to know that as the population and demand increase, the price will never fall below a paying basis.

THE HORTICULTURAL APICULTURIST.

The beekeepers of the State have their eyes open, and they, too, are not to be found napping. They know the excellence of the soil and climate. Many of them are located in cosey little valleys where warmth and good soil produce trees as it were by magic and where fruit comes in earlier than in many places to be found elsewhere. They, as we were going to say, are planting trees for the fruit they will yield, notwithstanding that they keep bees and that bees are said to do great damage to such crops.

It bids fair that every apiary in the land, no matter where located, will have its fruit trees growing in close proximity to the hives. Where a sufficient acreage will warrant, many trees will be set out; the fruit, if raised too far from city markets, will be dried on the premises, or sent to the nearest fruit cannery or canned by a new process now being much used in the states right at home. Thus it will be seen the California apiarist is not going to starve. He can, in a dry year, irrigate his trees, for he generally lives where water can be easily conveyed in ditches to any desired spot. If at any time the bees make a raid on the fruit, as many fruit men claim they do, then away he can send them to the mountains, further up their sides, till the fruit season is over, which is not, by the way, a long season for stable kinds. The raising of honey and fruit in a practical way by our apiarists is something that is hoped will be a success. It will add materially to the prosperity of the commonwealth to say nothing

of the financial condition of the cultivator; which is the earnest wish of the writer,

W. A. Pryal.

No. Temescal, Cal.

NOTES FROM NEW ZEALAND.

Ed. Am. Apiculturist:

While your bees are taking their winter rest, ours are in the height of their summer activity. Though the season up to the present has been only moderately good for bees, a good quantity of honey has been secured in most districts, and should this month and next continue as good, or better, the season's results will be satisfactory.

New honey is now being placed in the market and fair prices are being obtained. The N. Z. B. Association has made an attempt to regulate the prices of honey, so as to maintain a fair rate, and prevent the market being glutted by persons anxious to sell their crop at once. The retail dealers, I understand, resent this interference on the part of the association, and as there are a good many producers who are not members of the association, it is likely to be a difficult question for the committee to deal with. Hitherto there has been no regular supplies or market rates or anything satisfactory to guide either the seller or the buyer. A woman from the country was recently in Auckland selling her new season's honey in 1 lb. sections to the dealer at a sixpence per lb. Imagine her disgust at finding that others had been selling theirs at nine to ten pence.

Now that persons who have for some time been keeping bees begin to understand the nature of foul brood it is being found in many parts of the colony, and an effort will be made to obtain legislation for the purpose of exterminating it if possible. I fear but little practical good will result from this. The numerous cures which are now being published and tried may do more. I have an idea that it will have its periods like those infectious diseases which attack cattle, horses, and sheep, but which pass away. The injurious effects may be greatly reduced by care and the use of those remedies which experience and science suggest.

Our second Auckland annual show is in course of preparation and will probably take place sometime in March next. A liberal prize list is being arranged, which will no doubt induce a good display both of honey and the various appliances of the apiary.

In New South Wales, Victoria and South Australia rapid strides are being made in beekeeping. In a few years if the progress continues it will have grown into a very considerable industry, and honey will form one of the regular articles of diet; a position which it has not, by any means yet attained in these colonies, but is looked upon more as a luxury, beyond the reach of the masses.

As the demand for hives and other appliances increases, greater efforts are being made by the manufacturers to supply it. Some of the colonial makers are, however, adopting a questionable mode of securing, or trying to secure, the monopoly of certain well-known and valued articles, by taking out patent rights for these as inventions of their own. Most of these articles are from your country and not patented there, such as the Langstroth frame and hive. Such proceedings are very reprehensible, and of no legal force if contested, as only genuine inventions can be patented, but they serve to frighten those who know no better.

N. Z. Correspondent.

Jan. 2, 1885.

CANADIAN DEPARTMENT.

R. H. HOLTERMANN, EDITOR.

— There is a rumor afloat that a leading beekeeper and advocate of the deep frame in Canada is about to start a bee journal here. There is no doubt that a party not interested in the supply business, or so strong an advocate of a particular frame, would meet with a heartier support both by contributions in writing and by subscriptions.

It is a difficult matter for any man to take a neutral ground in one department of his business when he knows it will act detrimentally upon another.

— In consequence of the flow of honey being early last season, and there being very little honey after clover bloom, many bees were deficient in stores in the fall; then too, the unusual changes of atmosphere seemed to cause a large consumption of stores. In consequence, unless the apiarist has been careful to see to the wants of his bees, and understands bee-feeding, they are likely to come to grief. Many are, in fact, now complaining that their colonies are too light; some parties are already feeding, and unless this is done cautiously the loss will be serious.

We are aware that all feeding should be done in the fall of the year, and the bees remain undisturbed in winter, but if the stores become exhausted during winter, they certainly should not be neglected, as with proper precautions the chances of success are very probable. Those requiring to feed their bees in the winter are generally those who know least about the proper method of doing it.

Syrup or honey should never be fed at a time when the bees are unable to leave the hive, as it causes too much excitement, and often dysentery, debility and death. Probably the manner of giving food with the least exciting effects is on top of the frames where the bees can naturally have easy access to it, and it can be placed without the least disturbance to the bees. Perhaps the experience of some older beekeepers would be valuable, but a good food is considered as follows: pure granulated sugar mixed with water and brought to a boil of a consistency that, when about 90°, it will be *very slightly* soft. Or, as follows: granulated sugar three parts, water one part, boil to the consistency of ripe honey, pour out upon a marble or other cold slab; when cool enough to handle, knead a little and pull over a hook until the mass becomes white, roll into sticks the desired thickness, and when nearly cool break off into the desired length. This latter above the cluster will soften enough to enable the bees to work it readily, but will not become sticky. The candy does not enable the bees to get too much at a time.

—In Canada we want a grand convention where will be discussed mainly the various forms of hives and the experience and reasons for adopting certain frames, etc. There certainly is a reason for everything and we want to hear fully the reasons for the superiority of any one hive. Having full reports of such a convention circulated much good would be done and not only those attending would be benefited but also those reading the reports. This is a very important subject. Beginners are very apt to take the advice of the man who is dealing in supplies best known to them, when the name may be obtained through advertising or a knack of bringing one's self into prominence irrespective of merit of the hive. We

should not accept the views of any man but judge for ourselves if there is reason in his statements.

—Reports from leading beekeepers state that bees are wintering well. One having over 200 colonies, and a very old beekeeper, in calling upon us, stated he believed the indications had not been more favorable for many years. Another, a possessor of 12 colonies in Langstroth hive, reported upon looking at them Jan. 2, that ten were starved and the remaining two were without stores; it was 6° below zero. He transferred them to full combs and so far they are doing well. This represents well the two sides of the picture: the former managed properly last fall; the latter had given little care. Many of the latter will lose heavily.

—Orders are coming in fast to supply dealers. Inquiries for foundation have been made for some time and indicate that orders will be given early to secure a supply, as last season's experience has taught them that it is far better to order early.

NOTES AND QUERIES.

—Prof. Cook kindly sends us the following note of congratulation.

"I wish to add my congratulation on your invention of questions and answers from various apiarists. It is one of the best devices ever conceived and executed by an editor. One of our ablest beekeepers, who is about to start a bee paper, wrote me not long since for suggestions. I replied that the question scheme devised by S. M. Locke, and liberal contributions from the ablest beekeepers, would be the vehicle to success." A. J. Cook.

—The first thing bees get honey from in the spring is skunk cabbage, followed by yellow willow. Then come the blossoms of fruit, hard maple, white clover, small fruits, basswood, sumach, winding up with golden-rod, aster, Spanish needle and smartweed.

—There are so many beekeepers who would like to read "Huber's work, that we have decided to reproduce an English edition of it in the "Apiculturist," giving one page each month. Mr. Arthur Todd, of Philadelphia, Pa., who had in his possession an English edition, has kindly agreed to furnish the manuscript.

—A short time since we published the first edition of our "Bee Keepers' Companion," a little pamphlet, filled with valuable hints and information, and now those to whom they have been sent are calling for packages of them, for distribution among their beekeeping neighbors. Now, if any of our readers wish to assist us, and also become our agents, and obtain either cash or other premiums, we will send free of *charge*, a package of the "Companions." Just send your address, and try a few. You can obtain a valuable premium, just as well as not. We are working for you, and you should assist us.

—The glutted honey market and depreciated panics in honey come not from an over-production, but because the beekeepers have left to the commission men in our large cities too much of the work of creating a demand for honey. United and coöperative association work will build up a demand that will many times exceed the present supply, but it depends on the beekeepers; if their own individual duties in this matter are neglected,

or disregarded, we shall have trouble.

—"Rural, jr.," thinks it about time everybody knew that "bees are as deaf as a post," and that the beating of all the tin pans in two counties would not restrain a departing swarm. His way is to throw among the flying mass water, or the sun's rays by means of a mirror. The latter plan he has never known to fail.

—We have received from Bagnall Bros., Tura Thames, New Zealand a fine photograph of one of their apiaries. With the temperature here below zero, and snow and ice all about, it makes one almost homesick, as he in his imagination realizes that it is summer there, and the bees are merrily humming about as they flit to and fro, in the warm sunshine.

—A. S. Wilson, an English scientist, has made an elaborate calculation to show the marvellous industry of bees. Starting with the ascertained fact that 125 heads of clover yield approximately 15,432 grains of sugar, and that the proportion of sugar in honey may be roughly estimated at 75 per cent, he finds that 2,500,000 clover flowers must be visited by bees to obtain one pound of honey from that source.

—Hilas D. Davis of Bradford, Vt., has lately suffered a great loss in the burning of his supply factory with a large stock of lumber and his entire outfit of new machinery, a loss of about $3000. He has just visited us and he proposes to rebuild his factory and continue his business. He has just ordered a new lot of machinery. His courage and enterprise are commendable.

NORTH EASTERN BEEKEEPERS. ASSOCIATION.

The sixteenth annual convention of the N. E. B. A., was held in the City Hall at Syracuse, N.Y., Jan. 21–23, 1885.

FIRST SESSION.

The convention was called to order at 1.30 P. M., Pres. Root in the chair, Sec'y Geo. W. House at the desk.

After the calling of the roll, the Sec'y read the minutes of the last meeting, which were adopted and placed on file.

Treasurer Bacon made his annual report, showing a balance on hand of $43.39. On motion, this report was accepted and placed on file.

On motion of Sec'y House, it was agreed that the Standing Committees, and all other committees, report on the morning of the 23rd.

Sec'y House, at this point, appointed Silas M. Locke as reading clerk. An address on "The coming Bee," by Mr. James Heddon, was then read and discussed.

The next topic for discussion was, "Is stimulative feeding profitable and practical?"

Messrs. Root, Bacon, Snow, Vandervort, Locke, Clark, Betsinger and others took part in the discussion; and it was the general opinion, that bees should not be stimulated to undue activity in early spring, as it causes them to breed too rapidly and waste while on wing, in search of water, etc.

Different methods of feeding were described, all of which are well known. The convention seemed to favor placing the food inside of the hive, in preference to feeding in the open air.

All agreed that it was beneficial to feed the bees between fruit-bloom and white clover.

The topic "Will it pay to sow or plant for honey?" was next taken up for discussion, Messrs. Root, King, Bacon, Vandervort, Locke and others, taking part.

It was generally concluded, that it would pay, especially on poor land, to sow for bee-pasturage; and abundant evidence was given to prove, that alsyke clover not only yielded well as a honey plant, but also made a fine quality of hay. Mr. Root preferred one-third of this clover, and two-thirds timothy, to any other quality of hay. It was advised by one member, that the alyske clover be cut early, as the second crop was very valuable for honey.

It was stated that England was much in advance of us on this matter; and that much of the honey produced there was gathered from artificial pasturage. Utah stands high as regards the quality of honey produced, and it was stated that 100 colonies of bees had been supported, for a time, on one acre of mignonette.

Considerable was said regarding the worth of Bokhara as a honey plant. It was said that Mr. D. A. Jones stated, that Bokhara clover, sown as a honey plant, paid him better than any other crop raised on the same land. It was good land and capable of returning him $50.00 per acre.

The beekeepers were advised to set out as many basswood trees as possible, as it will pay, and pay well. They will thrive best by streams of water, or in a somewhat moist soil, but will grow in almost any good soil. They should be set out almost 10 ft. apart. One of the members spoke in favor of the yellow locust as it comes into bloom between fruit and clover bloom, and also was very valuable for posts.

Mr. Vandervort said that he was getting more honey from the pea vine or white clover. The farmers in his locality pronounce it excellent for hay.

The next question for discussion was, "Spring dwindling—cause and prevention." Messrs. Root, Snow, Locke, King, Hetherington, Clark, Vandervort, Betsinger and others, taking part. A number of causes were suggested, such as poor wintering, which caused diseased bees; a poor quality of honey for winter food: a lack of sufficient winter stores, properly placed; an undue consumption of food, during winter; dampness during winter; unusual activity in early spring, caused by disturbing the bees (which was considered detrimental) and too much fall honey. Capt. E. J. Hetherington thought that spring dwindling was the result of constitutional weakness caused by poor wintering, conditions that impair their vitality.

He also thought that the conditions that governed beekeeping had materially altered within the last fifteen or twenty years, bringing atmospheric changes. As a prevention, it was advised that a good quality of honey or sugar syrup food, well sealed, be given the bees for winter stores, and not fed *too late* in the fall, 25 to 30 lbs. being sufficient. Keep the bees warm, snug and dry, and do not disturb them so as to create undue excitement too early in the spring.

On motion of Mr. Clark, the following resolution was unanimously adopted.

Resolved, That the chair appoint a committee of three,—before whom, all questions of whatever nature, coming before this convention, and not on the programme, shall be submitted, before such question shall be brought before this convention. The following were appointed as such committee:—

Mr. Arthur Todd, Mr. C. G. Dickinson and Mr. G. H. Knickerbocker.

After receiving membership dues, the convention adjourned to meet at 7 o'clock P. M.

SECOND SESSION WEDNESDAY EVENING.

After the opening of the convention, Mr. Arthur Todd of Phila., Pa., read a communication that he had received from Mr. Frank Cheshire, of London, England, who has made "Foul Brood" a study. Mr. Cheshire wrote as follows:

DEAR MR. TODD,

I send you one slide *Bacillus alvei* and one spermatozoa (you will probably have read my articles on Egg Organs of Queens before this reaches you). Kindly give my fraternal greeting to American beekeepers at the Convention and tell them that the cure of *Bacillus alvei* by phenol is absolutely positive but that I have recently found a different bacillus causing nearly identical symptoms with *B. alvei* about which I am as yet uncertain as to cure. *B. alvei* is the common one here, the other rarer. How it may be in America I do not know, but I can microscopically distinguish them. I should regard the submission of some specimens (single infected cells) to me for examination as a mark of friendly sympathy between the older and the younger nation, the small and the great country and the two great peoples, which would be very gratifying.

I write on New Year's Day and so conclude with wishes of the heartiest kind for every success to you in the West and to ourselves in the East and for eternal friendship in both.

Believe me, very truly yours,

F. CHESHIRE.

P. S. The bacillus is about one fifty-thousandth inch in thickness and one eight-thousandth or one six-thousandth long so that it requires a good microscope.

The slides are my own mounting and so not finished highly. The spermatozoa are stained as well as the bacilli.

Mr. Cheshire was then made an honorary member of the association. Mr. Todd announced that he would have *bacillus* and *spermatozoa* in shape for microscopical examination on Thursday.

[*To be continued.*]

QUESTIONS AND ANSWERS.

ANSWER TO QUERY OF J. B. HALL, IN FEB. NO. "APICULTURIST," PAGE 47, BY EDITOR.

"Caucasian Bees." Refer to page 122 in October No. of "Apiculturist" for 1883, an article written by Julius Hoffman.

"Caucasian Bees." Refer to page 169 "Apiculturist," December, 1883, an article by Arthur Todd.

QUESTION BY THE EDITOR.

There seems to be a diversity of opinion among our most prominent and successful apiarists and teachers in apiculture, regarding the advisability of stimulative feeding during the spring. Will you give your ideas respecting this subject, as it is a matter of considerable importance? We trust that those, to whom this question is sent, will give our readers a careful and thorough description of the matter, as it appears to them, in the light of their experience.

In answering, please state *when* feeding should be commenced; what kind of food should be used; what kind of feeder (if any), is used; in what quantities the food should be supplied; what effect is produced; if it in any degree prevents the bees from flying in search of water; what the relative condition is, at the time of the first large yield of honey, between colonies thus stimulated, and those that were left to build up without it.

In fact our object is to present our readers with a brief, but decisive explanation of this matter.

ANSWER BY L. C. ROOT.

I am impressed that our prominent and most successful apiarists will continue to investigate and experiment, no matter what the opinions of others may be, yet I realize the confusion that comes to the beginner from the variation of opinions on this subject. At present, my advice to beginners is to disturb the bees as little as is practicable during April and May, in latitudes as cold as central New York. Be sure they have plenty of sealed honey and use every precaution to prevent them from flying, particularly during cold days.

As the season advances, if there is a time between the different classes of bloom when no honey is afforded, all stocks that are not liberally supplied with honey should be fed. Feed nothing but pure honey. I am aware that under experienced management stimulative feeding may be practised to advantage, but the average person who has not had experience would not be benefited.

Mohawk, N. Y.

ANSWER BY PROF. A. J. COOK.

I have long believed that stimulative feeding at the proper time was very profitable. This is not a mere theory, as we have carefully experimented in spring and summer — when there were no flowers — and in autumn. We found by careful comparison that such colonies as were stimulated always increased more rapidly than those not fed. We feed always in April and May, use the Smith feeder, which is described and illustrated in my manual. Feed not more than a gill to each colony per day, which is done just in the evening. I feed extracted honey if we have it, if not, sugar syrup.

Though I am aware that some of our excellent beekeepers scout this idea, yet from actual and repeated tests, I am persuaded that feeding sparingly, whenever bees are not actively gathering, will accelerate brood rearing.

ANSWER BY J. E. POND.

The matter of stimulative feeding in the spring is one of great importance, and one that should be thoroughly understood. In the hands of an expert it will be conducive of great good; but the novice must understand that it is a "two-edged sword," and when used indiscriminately may produce much mischief. Its chief value consists in using it so to increase a colony, that a full and effective army of workers may be on hand to gather in the first spring yield, that otherwise would not have been able so to do. A few years ago I was an earnest advo-

cate of stimulative feeding in spring; of late I am of the opinion that more harm than good is caused by it. If a colony is lacking in stores it must be fed of course; this rule must be strictly followed, but is a far different matter from that of urging the production of brood at too early a date. New England weather is capricious; a few days of bright warm sunshine are liable to be followed by a protracted season of severely cold weather; an excess of brood at such a time is a positive injury. The bees intent upon their own preservation, still desirous of protecting their brood, hesitate about forming that cluster necessary to keep them alive, and the result is, that the brood is not only finally chilled past recovery, but a vast number of the workers lay down their lives, and thus completely destroy the effectiveness of the colony for the season, without having accomplished any good whatever.

Beekeepers ought to know almost to a day, when the first yield of honey will be found; and knowing this, can easily, if a colony is worth preserving, so build it up as a rule, without stimulation, that it will be fully able to take advantage thereof. Nothing more than this seems to be needed, and nothing less will produce the best results. Each colony, however, must be a "rule unto itself," and it is only by experimental practice that the best course to pursue can be learned. Not being an advocate of stimulative feeding, I shall not attempt to give any instructions as to best ways and means, but will say that a large amount of water is used during brood rearing, consequently the food used should be largely diluted therewith, else many bees will be lost in the attempt to obtain it from outside the hive, at a time when the temperature is too low for them to fly out with safety.

ANSWER BY G. W. DEMAREE.

I have practised stimulative feeding, more or less, every spring for several years past. Doubtless location, as pertains to earliness or lateness of honey resources, has much to do with the question.

1. It has paid me to stimulate weak colonies, and especially such as are scarce of stores. 2. It pays to stimulate strong colonies to get early swarms if they are desirable, or to get early queen cells if they are wanted. Otherwise it does not pay.

I feed sweetened water in any good cheap feeder. The amount fed depends altogether on the size of the colony. One pint of warm water, in which two ounces of sugar has been dissolved, is sufficient for a large colony if fed to them once a day, provided the colony has some stores in reserve.

I usually commence stimulative feeding as soon as the first natural pollen begins to come in, which is generally about the twentieth of March here.

As far as my observation extends, stimulative feeding increases activity in bees, and for this reason I defer the feeding till bees can safely be on the wing almost daily, at intervals.

A fair experience has led me to believe that it does not pay to stimulate full colonies that have plenty of stores, with the object of obtaining a greater quantity of honey.

Christiansburg, Ky.

QUESTIONS BY L. E. BURNHAM.

1. If you had colonies in the cellar which became short of stores before spring what method would you adopt to feed such colonies?

2. Would you recommend removing bees on a fine day to the open air and returning them again to the cellar after they have had a purifying flight?

3. At what time in the spring would you advise removing the burlap sheet which covers the brood nest and substituting therefor an enamelled cloth or any covering to arrest the escape of heat from the brood chambers?

4. At what time (in our climate) would you advise removing bees from cellar to their summer stand?

Essex, Mass.

ANSWERS BY L. C. ROOT.

1. If I had no sealed honey in combs I would fill a comb with liquid honey or sugar syrup, and place it in the hive at the side of the cluster of bees, and cover it well to keep it warm. Let the liquid be warm when put into the comb.

2. If bees are reasonably quiet in their winter quarters, leave them undisturbed.

3. Change them when they are placed on their summer stands in spring.

4. About the first of May.

We were unable to give Mr. Rasin's questions attention this month.—ED.

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RECEPTACULUM SEMINIS OF BEES.[1]

BY F. R. CHESHIRE.

THE labours of Siebold, Berlepsch, Leuckart, and others, have put the fact of parthenogenesis in bees altogether beyond dispute, but the argument, as these investigators have given it, although abundantly sufficient, has lacked that anatomical confirmation which it is the object of the present paper to supply.

Since the honey bee can be so readily kept under observation, and the modern hive which forms its habitat under domestication can be so easily and completely manipulated, it will be not only more useful but more convenient to concentrate our attention somewhat upon this member of the family Apidæ, although no doubt the facts to be introduced will apply with certain modifications to every species in it.

It must be remarked by way of introduction, that it has long been known that a queen or mother bee is not doomed to total sterility if raised at a part of the year when drones (males) do not exist, but that she, although later than at the normal period, begins to deposit eggs, which, however, are in no instance converted into workers, but invariably produce drones, which must be of course, in this case at least, generated parthenogenetically. Similarly, if a queen of the Italian race (*Apis Ligustica*) which has consorted[2] with an Italian drone be placed in a hive containing English bees (*Apis mellifica*) only, and which is itself located in a neighborhood where Italians are unknown, all her progeny, both workers and drones, will to the end of her life continue pure, carrying their characteristic yellow abdominal bands and a thousand other minor distinctive peculiarities; but should she leave with a swarm or die, the workers will raise a successor from one of her eggs. The queen resulting must of necessity mate with an English drone, and as a consequence the workers

[1] Reprinted from the Journal of the Royal Microscopical Society, London, Eng.

[2] All bees mate but once.

produced by her will partake of the two races, exhibiting amongst themselves those variations for which hybrids[3] are remarkable; but her drones, on the contrary, will be absolutely Italian; again showing that although their mother was impregnated, her impregnation had in no way influenced *their* generation, or that they as before come from unfertilized eggs. Occasionally in the absence of a mother-bee one or more of the workers[4] (which from their anatomical structures are incapable[5] of coition) will commence ovipositing and these eggs, from reasons now clear, develop drones only. Beyond these facts and many similar ones, it has been demonstrated that the drone produces a vast number of spermatozoa, and that the queen after conjugation is found to contain these stored in a receptacle to which the names spermatheca and *receptaculum seminis* have been given, and that these threads are the active means for possibly converting an egg that would otherwise have yielded a drone into a worker, or it may be a queen. But many problems have had no answer, and most conspicuously those which asked *how* these threads were transferred to the eggs, and how a mother could after her impregnation as needed supply eggs either fertilized or unfertilized, and it is to these especially that I invite attention.

As, however, the investigation shows beautifully that the queen after mating becomes most completely a creature carrying all the essentials of the two genders within herself, it will be necessary to consider the organization of the males.

If the abdomen of a queen be cut open down the sides by fine scissors and the three first dorsal plates carefully removed, we discover two very large organs filling nearly the whole of the enclosed space. These are the ovaries, and consist of from 100 to 120 tubes[6] each, all lying side by side and gathered into a bundle by countless small tracheæ which act as connective tissue. These ovarian tubes are at the upper end very small, and here each egg is represented by an initial cell, but during development it passes on, room being made for it by the escape of the mature eggs at the wider lower end. Each tube merges into the oviduct the commencement of which is formed by the opened-out walls of the peripheral ovarian tubes.[7] The two ovaries are thus covered below by very delicate but, as will be presently seen, highly organized membranous expansions which may be compared to funnels,

[3] The word hybrid is used here rather popularly than scientifically, and in obedience to custom. No assertion that *Apis mellifica* and *Apis Ligustica* are specifically distinct is conveyed. They may be merely well-marked varieties.

[4] Such workers are known as fertile workers. They are abundant amongst hive bees, but amongst some members of the Apidæ and Vespidæ they perform no unimportant part in the regular building up of the colony.

[5] One exceptional instance is declared, but it must be received with reserve.

[6] In counting these tubes, it is needful to thoroughly dissect, as the ovaries are not equally active in every part, and some of the tubes, thin and flat, may otherwise easily escape detection.

[7] The central tubes unite their lower edges and complete the covering above.

the delivery pipes of which (the oviducts) unite into a single tube, the common oviduct. If a drone be now opened in like manner, we discover in the same relative part of his body two organs much smaller in size, containing about 300 tubes, individually minute, but from which are evolved the thread-like spermatozoa, much as the eggs are developed in the queen, so that the ovaries of the queen and the testes of the drone are homologues of one another. A canal also on each side of the body conveys these threads as matured to the *vesicula seminalis* which is much larger than the testis, and here they await the object of their development. The homologue of this store-chamber is clearly the spermatheca of the queen. At the time of mating, spermatozoa require a medium in which they may be floated into their proper destination, and to supply this a gland is provided—the *glandula mucosa*—into which the *vesicula seminalis* opens, and during ejaculation the mucous secretion of the gland and the spermatozoa are sent forward together. The mucous gland, we shall presently see good reason to believe, has also its homologue in the queen, which now we had better scrutinize.

Near the commencement of the common oviduct, which is fastened by very complicated muscles to the fifth abdominal ring, we find the before-mentioned globular body rather more than 1 mm. in diameter, glistening like burnished silver, because densely coated with the closest and most curiously felted plexus of tracheæ with which I am acquainted. This spermatheca is in structural communication with the common oviduct, but the smallest roughness will break it from its attachment, and will frustrate any endeavour to discover how it is filled up and used; but with it separated, should accident detach it, we may still study the exceedingly curious and complicated valvula apparatus with which it is furnished. Removing it to the stage of the dissecting microscope,[8] and surrounding it with dilute glycerin, we get glimpses of a contained membrane between the meshes of the investing tracheæ. So far as I know, those who have studied this matter have failed to discover that these tracheæ merely closely embrace the actual spermatheca, and that they in no instance enter its walls; but such is the fact, and by very careful teasing and cutting with needle-knives we may so separate them that they may be peeled off as a rind from an orange. The sac itself is now seen to have beautifully transparent sides, giving faint indications of originating in coalescing cells, but having no discernible structure except near its outlet where it has an epithelial lining. Through its sides, if the queen is unimpregnated, we discern only a perfectly clear fluid.[9] If, on the contrary, she

[8] I use a "Stephenson's erecting binocular," and hardly think what I am describing could be accomplished with a simple "dissector."

[9] Leidy describes the fluid as granular, which is certainly erroneous. Leuckart says it is clear. Both of these observers appear to

has been recently mated, the whole interior is densely clouded and semi-opaque, since it is perfectly filled with spermatozoa; but as older and yet older queens are operated upon, the spermatozoa decrease in number, but instead of being generally diffused are gathered into a tolerably compact mass which lies near the aperture of the spermatheca, the remainder of the latter being filled with a clear fluid as in virgin queens.

This collection of spermatozoa is seen by a $\frac{1}{2}$ in. objective to be arranged in large, wavy, flocculus-like masses, the extremities of the motile threads pointing towards the aperture, while from its upper surface spermatozoa are observed to rise in different spots like microscopic eels, long and thin, curling and twisting with much grace as they hold on by their tails. After a few seconds they lapse into quietude, to be in turn succeeded by others, and in a warm room this most curious set of movements will long be continued, even though several hours have been occupied in dissecting the abdomen whence the spermatheca had been taken. It has been again and again asserted, as an echo of a bold guess made long since in America, that the narrower worker[10] cell in which worker bees are raised, by pressing upon the abdomen of the queen, was the effective means for the forcing out of spermatozoa and so causing these eggs to be fertilized. This notion, so repellent from its bald crudity, could only be previously met by negative evidence, and since there is no confidence like the confidence of ignorance, the error has died hard, and it is worth while in this connection to note that the closing valve of the spermatheca, which we are presently to examine, having been brought away *in situ*, holds so very strongly, that the sac may be squeezed flat in the compressorium without driving out a single spermatozoon. The pressure increased the delicate bag at length bursts, and a true microscopical marvel awaits us. The spermatozoa escape in tufts, each containing hundreds of thousands. These tufts have a beautiful arrangement, reminding one of a girl's back hair combed after plaiting; but each spermatozoon wriggles to be free, and quickly they are widely spread, curling and uncurling with a peculiar snapping movement, and with an energy that baffles description. Their powers in a few minutes begin to wane; then one after the other they take a form which with a $\frac{1}{2}$ in. or even $\frac{1}{4}$ closely resembles two 8's one over the other, surrounded by a rather larger O. When all have sunk to rest, this singular pattern, repeated with strange regularity, covers the field.

Let us suppose that a complete spermatheca is now before us; as we turn it we get it into such a position that its outline is not unlike the back of a man's head carrying two large and prominent ears.

have merely ruptured the sac by pressure, afterwards examining the expressed matter.

[10] Honey comb consists of two-sized cells; worker cells $\frac{1}{5}$ in. in diameter and drone cells $\frac{1}{4}$ in. in diameter.

These latter are the upper ends of two glands something less than 200μ in diameter, and which are held in position by receiving very numerous twigs from the investing tracheal plexus. These glands passing down the opposite sides of the spermatheca, meet together and form a junction near the spermathecal duct. They consist of nucleated gland cells surrounding a tube which runs from end to end and enlarges somewhat during its course. This tube gives off thousands of tubelets which pass to the distinct cells, upon the walls of which they seem to expand; but after considerable painstaking I feel myself uncertain upon this point.

The spermathecal duct which is short, stiff, and slightly rugose, points towards but does not immediately join the duct of the appendicular[11] gland. Attached to these ducts and valve are five main muscles, two of which are sphincters, and which are the main instruments for respectively and independently closing the spermathecal and appendicular gland ducts. These sphincters, which are separated by an intervening wedge-shaped disk, lie towards each other at an angle of from 30° to about 60°, and may be beautifully shown by polarized light. The prisms being crossed the object is so staged that one sphincter most completely resolves the polarized beam, by which every fibre in it can be perfectly dissociated from its companion, which is placed at such angle that it gives no perceptible twist to the plane of polarization, and so remains out of view. The rotation of the stage plate now darkens the first observed sphincter, while the second becomes brightly illuminated. An indurated integument, probably a chitinous plate, is pushed towards the spermathecal duct by the contraction of its proper sphincter, and in this work it is aided by a muscle which is one of two, the tendinous extension of which is only about 25 in diameter, or $\frac{1}{24}$ of the thickness of a human hair.[12] These muscles would, no doubt, all remain tense the insect being in a condition of repose; but should she be engaged in ovipositing and spermatozoa be required for fertilization, the muscle by contraction[13] would lift the plate to which by a complex tendon it is attached. Into the cavity thus opened spermatozoa would pass. The two sphincters at the same moment relaxing, an outflow of glandular secretion would be ready to sweep the spermatozoa towards their destination in the common oviduct, and all would be at once driven on by the appendicular sphincter first contracting, followed in order by the second

[11] This name appears to me not well chosen, but since it has been given it had better be retained, although "mucous gland of the female" would have been more expressive.

[12] I fully feel the difficulty of interpreting a mechanism such as this, but very many dissections made with great care and most scrupulously examined, will, I hope, be thought to justify the explanation given, which certainly seems to me to satisfy fully both the natural history and microscopy of the case.

[13] I am fully satisfied that those muscular changes would be all produced by reflex action.

sphincter and muscles, when the repose condition would again be established.

A most remarkable adaptation here arises. The spermatozoa yielded by the drone are probably about 4,000,000 in number; but these need to be economically utilized, as, if they were shot out haphazard, they would be exhausted long before the queen's death, when she would breed of course drones only (a circumstance which does actually, although somewhat exceptionally, arise when queens run on without accident to the ripe old age of four or five years); but the duct through which they pass, I find to be the centre of another gland, which seems to the present to have entirely escaped attention. This gland is, no doubt, excited to secretion by the presence of the spermatozoa, just as food excites our salivary glands to the secretion of saliva, and the stomach to the secretion of gastric juice. Spermatozoa thickly present will cause the addition of large quantities of fluid which will dilute and more widely separate them. Their absence (for this gland is most richly provided with nerve-twigs, which send numerous loops to the muscles previously described and to the ganglion seen lying under the muscle) will yield the action which will send a new contingent forward as I have described, and so they come to be paid out with some regularity. The necessity for this regularity will be better appreciated if it be remarked that a prolific queen will lay 1,500,000 eggs, each about 1·8 mm. long, 0·4 mm. in diameter, and that these would fill, if systematically packed, a half-pint measure. Deducting a few thousand for drones, the remainder would each require an independent fertilization, and for this work probably not more than 4,000,000 and often very many less spermatozoa will be at command. We shall presently see that the number of spermatozoa and the size of the receptaculum appear to be proportioned to the laying capabilities of the insect, and hence in every case some such mechanism as we have been examining will be a necessity. In the common wasp, for example, the fecundity is much less than in the hive bee, but the spermatheca is much smaller, the capacity of that of the latter insect being about forty times that of the former, while the spermatozoa are nearly of the same size.

The channel is fairly wide, and at first I supposed it tolerably straight and simple, but upon examining it with the low-angled front of a Powell oil 1½ in., I discovered it to contain a membrane of extreme tenuity and remarkably convoluted, reminding me much of the curious structure of the epididymis of higher animals. The meaning of this peculiarity I can in no way explain. Tracing this channel onwards till it perforates the side of the common oviduct, a bifurcation is detected, one channel of which appears wide and indefinite and to be presently lost in the lower part of the oviduct, whilst the other

enters a central[14] and curiously folded apparatus which, for a reason to be presently explained, I shall denominate the fertilizing pouch. I have strong reasons for supposing that the path upwards from the *bursa copulatrix* (where the male organs of the drone are retained at the time of copulation) and through the pouch aforesaid to the spermatheca is so involved that it would not be possible for the spermatozoa to enter the latter by following it, but that in the early life of the second wider and straighter channel to which I have referred is fully open and by it the spermatozoa, with their inscrutable power of self-direction, pass upwards, avoiding the mazes of the fertilizing pouch and packing themselves for future use. The queen if still unmated at four or five weeks old becomes incapable of copulation, or at least she evinces no desire for it, and this possibly marks the time when this lower passage closes; this closure in a mated queen forcing the spermatozoa in descending to take their way to the fertilizing pouch.

If a central comb be lifted from a hive during the summer months, eggs in number will be discovered. If one of these be removed from either a worker or drone cell by the wetted point of a camel's-hair pencil, and then microscopically examined in water or glycerin, its surface will be found beautifully netted (the chorion), almost as though a tiny pearl had been covered with what the ladies call "blonde," hundreds of the meshes of which were required to coat it completely. Towards one end the netting makes its cells long and narrow and pointing towards a circular spot, just as the cordage of a balloon points towards the upper valve by which the gas is allowed to escape. This circular spot, I need not here explain, is really an opening called the micropyle, by which the spermatozoon enters and unites its material with the germ cell, so bringing about fertilization. It will be remembered that it has been already stated that in bees this fusion of male and female elements produces the female (partially developed as to sex in the worker, and fully so developed in the queen), which will possess qualities of both father and mother, so that the tiny spermatozoon not only differentiates the entire creature, but communicates unerringly differences of species or mere variety even. The spermatozoa from Cyprian, Italian, and English bees are to the most refined microscopical examination identical, and yet they contain differences which determine almost countless variations in form, color, size, instinct, capability, and temper.

That the spermatozoon enters the egg is certain, for it may be found if the latter be carefully examined immediately after deposition. (It is my opinion, resting upon facts which do not fall within

[14] The tracing of this channel I found extremely difficult in the hive bee. The problem in the common wasp is far easier, since in the latter the walls are stronger and more definite.

the scope of this paper, that Siebold[15] has possibly been in error in imagining that he has noticed more than one spermatozoon within an egg. The great length of the body, about 250 μ, necessitates many convolutions and would make misconception easy [16]). The head of the spermatozoon is very narrow in order that the micropylar aperture may be passed, but to effect this time must be occupied, and how is this given? It is clear from what I have already said that the spermatozoa pass not into a plain tubular cavity to meet the descending egg, but into a pouch which I find to be elastic and curiously formed of folds of the lining membrane of the common oviduct, and which takes up picric acid from picro-carmine far more freely than the oviduct proper, whilst its surface is dotted over with linear patches of setæ from two to six in a patch and from 1 to 3 μ in length. Its structure is particularly difficult to examine, and I should require to carefully dissect many more examples of it before I would commit myself to a drawing, but I am satisfied that into or against this pouch[17] the eggs that are to form workers are conveyed, and that here they are brought into contact with the spermatozoa and fertilization is accomplished, while drones are evolved from eggs which are carried down by the side of the pouch to the ovipositor and so escape all contact with the fertilizing fluid. The oviducts are very highly organized, containing a most beautiful system of longitudinal and transverse muscular fibres repletely provided with nerve-twigs, evidently giving to the oviducts the most complete control of the eggs which are to pass through them, while, as just hinted, they are not without strong indications of two specialized but confluent paths one towards the fertilizing pouch, and the other to its side. Near the junction of the oviducts also there are two thin muscles for which I can conceive of no purpose, unless it be to so reduce by their contraction the opening lying by the side of the fertilizing pouch that an egg could not, except it be relaxed, pass in this direction and so escape fertilization.[18]

The nerve structure of these parts would lead me quite beyond the intended scope of this paper, but it should be stated that the last large abdominal ganglion lies immediately beneath and in contact with the oviducts and from it branches of nerves run in abundance into the oviducts, the sper-

[15] Siebold "On True Parthenogenesis," p. 85 *et seq.*

[16] I have not failed to note that possibly the body of the spermatozoon is very elastic, measuring much less in the coiled than in the straight form.

[17] Is not the pouch described by Mr. Lowne as the *bursa copulatrix* of the blow-fly the same in use as the form now engaging our attention? The *bursa copulatrix* of the bee is lower down. It is worth noting here that the diameter of the pouch is about 60 μ greater than that of the egg.

[18] The complicated structure which Mr. Lowne gives to corresponding parts in blow-flies and their general similarity to those I find in bees, lead me to ask, whether it is not at least possible, if indeed not highly probable, from what we know of members of other orders, that one of the sexes in the blow-fly may be parthenogetically produced?

mathecal valve muscles, the sting and ovipositor, while small ganglia are distributed in profusion, a considerable one lying over the valve, and sending branches forward into the fertilizing pouch.

It has been lately noticed by some American beekeepers that if a maturing queen, that has still some days to pass in her cell before gnawing out, has her cell opened at the upper end so that into the aperture a crushed drone larva may be put, the aperture being again carefully closed, she will in due course appear as an imago, but that she will already be fertilized. It is stated that in many cases queens so treated have commenced laying fertile eggs almost directly after leaving the cell. Incredible as this might at first appear, it is well worth the careful attention of microscopists. The testes are very early developed in the full-grown larva of which I have found seminiferous tubes and spermatic filaments in active movement (this is quite in agreement with Mr. Lowne in his observations on blow-flies), and this fact will afford a probable explanation. The larva which is to be developed into a queen is provided by the workers with extremely large quantities of a specialized food of very nutritive character. This is inserted into the upper end of the pendulous cell, and being somewhat viscous the growing larva sticks upon its surface by capillarity. At this time there is of course no anus and no genital aperture. When the chrysalis condition is assumed, the body still adheres to the pappy unconsumed food, from which I have little doubt nutriment is still received by osmosis. The spermatozoa with their marvellous vitality, still surrounded by drone juices or nutrient food, would survive until the developing queen ruptures the very delicate integument which is thrown off at the last moult; they then would pass into the vulva and enter the spermatheca, giving us a queen fertilized from the birth, but one which, no doubt, would carry but few spermatozoa, and so be practically useless—a point which the microscope could alone determine. But in this quaint performance practical men have given to the embryologist a method of experimenting, which may yield good results. Every scientific investigator would see at once far better methods of procedure and possibilities, it may be, not only of tracing the course of the spermatozoa, but of producing hybrids and mules, the study of which may be of immense interest. I hope at any rate to institute experiments in this direction in the coming summer, by which one doubtful point may at any rate be made to pass from the region of speculation to that of knowledge. It is as follows:—

Although the drones produced by the fertile workers (to which reference was previously made) develop spermatozoa exhibiting microscopically all the appearances of those obtained from the normal drone, still the virility of the insect has been questioned, practical

men supposing that because he was of doubtful origin he probably was impotent. This question has both a practical and scientific value. Practical, because if the spermatozoa from these fertile-worker-drones are equally effective as those from normal drones, the apiarist would have at command, by keeping a fertile worker ovipositing, a stock of drones at a season of the year when they would not be obtainable from an impregnated queen, and hence he would possess the means of raising and fertilizing queens either earlier or later in the season than would otherwise be possible. The scientific interest centres about the fact that it is well known that amongst the higher animals where a mother has borne offspring the influence of *its* father may be impressed on her progeny afterwards begotten by a different parent, as in the case of the transmission of Quagga marks to a succession of colts both of whose parents were of the species Horse, the mare having been impregnated by a Quagga male; or in the instance (many cases of which I have observed amongst our own poultry) of a pullet being spoiled for the breeding of fancy stock by some accidental misalliance. The explanation of the first given phenomenon, which rests upon the statement that probably the blood of the female imbibes from that of the fœtus through the placental circulation some of the attributes which the latter derived from the male parent, does not seem so directly to apply to the case of the insect as does that of the fowl, for it appears to me that it may be argued that in the queen-produced-drone, although there is no actual spermatic fusion, still the fluids of the queen generally are not uninfluenced by the constant presence of spermatozoa within her body, and that this influence may in some unknown indirect way transfer to the drone some qualities of the male with which the mother mated, and it certainly is evident that these spermatozoa are not cells, in the rest condition. They not only are in partial movement, but they are abundantly aerated, which seems at once to prove that they absorb nutrition which they subsequently oxidize, and that they as a consequence yield products which must pass into the general blood-current. On the opposite side it may be urged that facts known to entomologists would seem certainly to indicate that no such slight indirect influence derived from copulation as is here suggested is necessary, for amongst moths at least twenty generations of females have been produced without a single male individual making its appearance. The coming season will no doubt furnish some with an opportunity of testing the question by inserting larvæ or the testes of drones derived from fertile workers into queen cells. The marvellous persistence of the spermatic cell is worthy of note in passing. One taken from a queen four years old is utterly indistinguishable from another derived direct from the drone testis, although the former must have ex-

isted in the queen's spermatheca the whole of her life, less from five to ten days, between which ages queens almost invariably mate.

SOMETHING NEW FROM GERMANY.

By L. STACHELHAUSEN.

It might be of interest to the readers of the "Apiculturist" to learn what discoveries and observations have been made of late in Germany regarding beekeeping. I will here relate, therefore, what seems to me to be the most important.

1. Under certain circumstances it may be of importance to prevent the building of drone comb without the use of too much comb foundation. One prefers to let swarms build full combs rather than to furnish them with comb foundation, because as a rule they build nice worker comb. But unusually strong colonies, later on, build more drone comb. At such times I use comb foundation, but the partially completed combs are now finished with drone comb. The apiarist must therefore replace this with comb foundation, which is a very laborious task consuming much time. Mr. A. Zimmerman has recently observed that if he cuts away drone comb, that has been commenced, to the worker brood and then shaves off both sides of the comb to the edges (V-shaped) the bees will replace and complete it with worker comb.

2. The invention of Mr. Zöll (of Everdorf, near Kissingen), who has succeeded in constructing whole combs with full-depth cells, is perhaps of more practical importance. In the fall of 1880 even, such combs were to be seen at the exhibition at Frankfort-on-the Main. They are said to have been very much heavier than natural combs; but in this the first steps have been taken which will lead in time doubtless to the improvement of the established method.

What influence the invention will have in practical beekeeping, I am unable to judge, and I know nothing concerning the method of making such comb.

3. Another invention has been made by E. von Freyberg, namely, that of the artificial capping of natural cells filled with honey. One can by this method save the bees the labor of doing this, and late in the fall such combs can be given to the bees for winter stores. Very likely this affords other advantages. The cells of the horizontally lying comb are filled with warm honey or sugar syrup; then a sheet of white filtering paper, on one side of which warm wax has been spread, should be placed wax side down upon the comb; on this lay several sheets of paper and then over this pass a warm iron lightly.

Upon removing the extra sheets of paper, you will find that the waxed paper is stuck fast on the comb.

By a method recommended sev-

eral years since by Knoblauch, liquid honey is blown on the comb (which has been filled with honey or syrup), by means of a duster. This, however, gives but an imperfect covering, while the former method is said to give satisfactory results.

There have been many valuable theoretical discoveries lately made in Germany regarding beekeeping. To these belong more especially

4. The examination and exact description of the so-called *orifice of the stomach* of the bees, by Schonfeld (Bee Journal, 1883, Nos. 9–10). This organ of which but little has been known until lately is of great importance to the subsistence of the bees, and many features in the life of the bees which have been shrouded in darkness are explained through the critical and exact examinations of this organ. I will here mention only one circumstance.

Several authorities have asserted that in the large glands on both sides in the head of the worker bees (salivary glands) the food sap for the young larva is prepared and separated. This was always disputed by Schonfeld and the construction of the orifice of the stomach seems to show that he is right and to prove that the food sap is nothing but chyle from the digestive stomach of the bee, secreted at will by the help of this orifice of the stomach.

5. The apparent economy of space and the saving of material in the hexagonal form of bee cells have always been a subject for admiration and it has generally been supposed that this was due to a singular instinct on the part of the bees, and yet it was presumed by some that it was the result of chemico-physical laws; but it seems that only Dr. Möllenhof of Berlin has succeeded in establishing a satisfactory theory by which it no longer appears necessary to attribute this to a high order of instinct in the bees. It would take too much space, however, to describe it here.

6. Another observation of Dr. Möllenhof is of great importance. Before a honey cell is capped a drop of bee poison is mixed with the honey. As the powerful antiseptic effect of the bee poison has been demonstrated, it is not to be doubted that this addition to the honey contributes greatly to its preservation. Through this there is also given an explanation that shows how the bees, under favorable circumstances, can defend themselves against the much-to-be-dreaded foul brood as the bee-poison is able to destroy the Bacteria, or germ, if used in sufficient quantities.

7. One observation of the greatest importance is that of the mating of the worker bees with a drone. On July 20, 1883, Mr. Kremer found in his garden one worker bee to which a drone was hanging. The worker tried to free itself from the already dead drone, twisting around in a circle, dragging the body of the drone with her. Kremer caught the couple and immersed them in spirits.

The well-known and very expert Schonfeld examined them and proved that copulation had actually taken place and that it was surely a worker bee and not a small or imperfect queen with which the drone had mated, because: 1. The hind legs were shorter as is the case with the smallest queens and provided with the pollen baskets which are missing in the queens. 2. The head was absolutely that of a worker bee. 3. The sting which was present was that of a worker. 4. The ovaries were undeveloped as is the case with worker bees. 5. A seminal vessel was nowhere to be found. 6. The honey stomach and the orifice which is to be found in it are different in the queen from that of the working bee and showed here the nature of the latter. 7. Finally, the pollen right from the great-gut proved that here was actually a working bee.

Of course this observation proves nothing against the Dzierzon theory or parthenogenesis, as an impregnation of the worker bee is impossible, but goes to show that bees before they commence to lay drone eggs can and do become amorous. In Germany, of course, this observation has called forth lively interest and a great interchange of opinion.

Selma, Texas.

WHOSE HAT (QUESTION DEPARTMENT) IS IT?

EVIDENTLY the editor of the A. B. J. does not enjoy being complimented on the improved appearance he makes in Mr. Locke's hat. It is so much better than his old one that we are all glad that, before he attended the World's Fair, he got a new hat from "down east." Strange to say he declares it is not Mr. Locke's hat at all but an old one of his own and that he can prove that he wore it *once* at so early a date as May, 1879. He has not worn it since until quite recently because he has been taking a nap (Rip Van Winkle) and he does not wear a hat when he is asleep. Furthermore, while he was asleep, Locke stole it and made such a commotion with it as to awake him. However he won't complain or make any fuss about an old hat if nobody will accuse him of taking Locke's new one. It is our duty to remind him, however, that the punishment, if not the guilt, is greater for taking a new hat than for taking an old one. I had hoped for an amicable settlement, until just now my eye chanced to rest on an editorial note in *Gleanings* that evidently means war (civil I hope). As I understand it, he accuses both parties of being moral pirates or at least they are guilty of not taking out "moral patents." He says the hat they have been wearing between them is one worn by the editor of the Beekeeper's Instructor in 1882. Now I find on taking measurements that the hat worn *once* by Newman in 1879 and worn *once* by Thomas in 1882 is entirely *too small* for the editor of this journal, therefore, I conclude Locke must have a new one. Who shall

decide when editors disagree? Prof. Cook? He says (see "Api." of last month) that Locke has not only a new hat but that it is a good one. So say we all.

The editor of *Gleanings* says "In the 'Apiculturist' for Feb. our friend P. H. Elwood takes the A. B. J. to task for copying (without credit) the plan of the question department, claiming this to be original with the 'Apiculturist.'" He (Root) carries the idea farther in that this plan was a special feature of the Beekeeper's Instructor for 1882. I have referred to the question department of that journal for 1882 and find it was conducted after the usual plan with no indications that the editor had ever a thought of changing it. I do find an editorial chiefly made up of the opinions of the different honey dealers on the subject of marketing honey; but this has nothing to do with the plan of conducting question departments, and in the same and in succeeding issues we find this department conducted as it always has been in bee-journals, until the editor of the "American Apiculturist" changed it.

The editor of the A. B. J. refers us to his journal of May, 1879, and in making this reference I find another editorial article compiled after the same fashion as the one already referred to in the Beekeeper's Instructor and subject to the same criticism. The hat does not fit.

The facts are these. The editor of the "American Apiculturist" has, ever since the establishment of his journal, conducted his question department on a new and original plan. A carefully selected list of questions have been submitted to some of the more experienced apiculturists for answers and these answers with the questions have been printed in each number thus giving to its readers the result of the maturest thought and experience on the many topics presented. This fact is well known and appreciated by the beekeepers of America, as is also the additional one that until the present year no other bee-journal had a question department conducted in a similar manner.

Starkville, N. Y. P. H. ELWOOD.
March 20, 1885.

WINTERING BEES.

BY L. C. ROOT.

THE month of February was a very uniformly cold month, yet the bees continued to leave the hives.

From room A, I took one-half bushel of dead bees; from room B, twenty quarts.

The stocks weighed as follows: Mar. 1, No. 1, 76 lbs.; No. 2, 48 lbs.; No. 3, 58 lbs.; No. 4, 84¼ lbs.; No. 5, 34½ lbs.; No. 6, 100 lbs.; No. 10, 44 lbs.; No. 11, 50 lbs. It will be noticed that No. 6 had consumed 27 lbs. This stock died for want of stores. The weather was extremely cold, and as they were under the snow, I left them undisturbed thinking they had an abundance of honey.

The mercury in room A stood at about 48° during February. In room B, it varied from 30 to 45°.

April 1, I took from each room about one-half bushel of dead bees. The stocks weighed then as follows:

No 1, 73 lbs.; No. 2, 45 lbs.; No. 3, 55½ lbs.; No. 4, 78 lbs.; No. 5, 33 lbs.; No. 6, dead; No. 10, 40 lbs.; No. 11, 46½ lbs. The other three stocks that wintered out of doors, weighed as follows: No. 7, 112 lbs.; No. 8, 114 lbs.; No. 9, 98 lbs.

I set out the bees from room A, April 17th and from room B, April 18th.

I neglected to measure the bees that were swept from the rooms at this time, but I should judge there were no more than there had been during the same period previously.

No. 4 weighed at this date 75 lbs., No. 2, 45 lbs.; No. 5, 30½ lbs. The others I did not weigh.

In room A, I lost two stocks in twelve combs, Quinby hives, and three in hanging frame hives. In room B, I lost two stocks in twelve comb, and two in seven comb, Quinby hives. The hive in the attic was subjected to too much variation in temperature, particularly to too extreme heat, as the attic became very warm during sunny days. I see no advantages in such a place for wintering.

Considering the condition of these stocks when they went in winter quarters (being composed of nearly all old bees, and the disturbance caused by the frequent observations the results are better than I anticipated. Bees from apiaries where fall honey was abundant, and breeding continued late in the season, wintered much better.

In a future article I shall give some conclusions formed from these experiments.

A GUIDE TO THE BEST METHODS OF BEEKEEPING.

By J. L. Christ.

R. F. Holterman, Translator.

(*Continued from p. 58, Vol. III.*)

CARE IN PLACING THE COLONIES.

In placing the colonies care should be taken that the hives are somewhat higher at the back than at the front, say about half an inch, in order that the water and moisture and particularly that which during winter evaporates from the bees, can run out of the hive through the entrance so that it will not remain and cause the combs to become mouldy. The moisture is also injurious to the bees themselves. The gradual descent thus given to the bottom boards enables the bees to remove from the hive more readily their dead bees or any other foreign bodies that may be in the hive and it is always well to make all of the labors of the bees as light as possible.

REGARDING THE REMOVING OF THE BEES IN SUMMER AND WINTER.

If colonies are to be changed to other locations or positions in the

vicinity of the apiary, except in case of an emergency it should be done very early, say in the latter part of January or early in February; because even though they have flown but twice in the warm sunshine they mark their location, and if moved late the change must be accompanied by loss, as the bees either attempt to enter some other hive near by and are largely destroyed beside creating much disturbance, or else return to the old stand and perish.

Indeed I have noticed that many bees upon their first flight after a winter's confinement, returned to their last season's location which they had not forgotten.

If the new location is a distant one or even an hour distant the change in location can be made without danger at any time of the year. The bees then mark their new homes at once, flying about the hive on the first day in a great circle until they have become perfectly familiar with their location, after which they never forget it; or if they should err in finding it, on account of others being near by, they at once recognize the strange scent of the hive and return to their own.

REGARDING THE PURCHASE OF BEES.

In purchasing strange bees with the intention of establishing an apiary, one must be particularly careful, when he cannot obtain them in his immediate vicinity, not to select them from a location which is warmer or where the advantages as regards honey-gathering, etc., are greater than those of the position which they are to occupy. As sheep, cattle and other animals do far better when taken from a poor to a better locality, than if they are changed from a good pasture and warmer climate to an inferior pasture and more severe atmosphere, so do the bees thrive far better if taken from a cold to a warmer location and where honey plants are more abundant. For, as small and apparently insignificant as this little insect is, its body and its whole nature become hardened or tender depending upon surrounding conditions; and I have often found that bees in rather a severe and trying atmosphere have flown out and gathered stores when those from a warmer climate did not show themselves.

One should select, as much as possible, young colonies, which can be known by the whiteness and tenderness of the combs. Young colonies are to be preferred not alone for their combs, but also for their greater energy and industry.

One should purchase from those who care for their bees properly, and who do not experiment with and doctor them, but keep them clean. He should choose, too, colonies that will probably swarm early. The colonies to be purchased should be well stocked with bees and weighty as this is a most essential feature. The heaviest colonies are good for nothing if they are not well stocked with bees and brood, for if the cells are largely filled with honey, the queen is confined to only a few cells in which early brood may be reared, and in

consequence such colonies do not cast swarms at all in the spring or very late.

Because of this, unscrupulous apiarists having straw skeps act more wisely when they dispose of their lightest and heaviest colonies and keep those of medium weight for themselves. Of course every one,when weighing a hive or skep, will take into account the size of the same, also the season and the activity of the bees, as it may be heavy either with brood or moths.

The time of purchasing bees varies and we cannot always do as we would in the matter. To purchase in the latter part of February or March is the best and surest but the most expensive, and as a rule it is generally difficult to purchase bees at such time, as people seldom keep bees over winter to sell in the spring. In the fall they are the cheapest and most plentiful. Purchase when you will, the colonies should be thoroughly examined. (This is accomplished best at noon as at that time, even in the winter, if the weather is not too severe, one can lay the hives on the sides, and if the bees are flying they will sting less if handled carefully.)

You should tap the hive with the fingers and place your ear to its sides ; if you perceive a short, broken noise and hum within, the colony is weak in numbers ; the more prolonged the noise the stronger the colony. Blow in at the entrance of each hive when most of the bees will remove and cluster at the entrance. Those that show the largest number of bees at the entrance are the most populous, energetic and the best. You should then raise the hives or invert them and examine the interior. Notice if they are weighty, if the combs are well built out ; whether they are not very black and thick, and very old ; that there are no traces of the moth worm, nor webs about the combs nor black excrescences on the bottom boards of the hives ; or if perchance there may not be some of the moths in the pupa stage upon the sides of the interior of the hives, especially if you are examining them in the latter part of February or early in March. If the purchaser should have to stand security for the safety of the colony until, say, the time of apple bloom, stipulation should be made upon which the price and bargain will depend.

When one has purchased bees it is more advisable for both parties that the bees should be taken to their new home at once. If this is not done, however, one should paste a piece of paper over the top board of the hive or a band with two seals, one at each end, for there are dishonest people who will cut the honey combs at the top and replace the top board and often ruin the entire hive in that way.

If one purchases young swarms, (which is the more advisable, if he desires to purchase bees in his immediate vicinity), he should stipulate for the first swarms which are cast by midsummer and these are worth a florin more than those cast later.

One should provide three or four

"magazine" boxes (or hive) with their accompanying glass cover and entrances and let the bees enter their hives at once; where the bees are very strong, four boxes are enough; where not, three will suffice. They should be removed on the first night and placed upon the new stands. If, however, the swarm is in the straw skep and it has been moved on the first night, it should, upon being placed on the new stand, be put upon a white cloth and the magazine (or hive) placed upon it and in front of the straw skep; a block of wood should be placed between, then knock the skep upon it so that the bees will all drop upon the cloth and they will enter the hive.

REGARDING THE TRANSPORTATION AND SHIPMENT OF BEES.

In the transportation of bees one has to be very careful that they do not meet with any misfortune and that they are always well supplied with air. It is especially dangerous and requires a great deal of care to ship them in summer. One can only ship them at night during that season, and if it is not possible to complete the journey in one night they must be deposited in a convenient place during the day and the bees allowed to fly and the journey continued on the following night. If the colonies are well built one can prepare an affair for carrying them, such as the salt carriers have and carry upon their backs. Under the bottom of the hives is stretched a cloth when one can march away cautiously with the hive upon his back. One should be careful that there are no holes through which the bees can escape and even then it is advisable that he should be provided with a bee cap and gloves which he can use in case of necessity. I consider it a hazardous undertaking to transport bees upon a wagon no matter how comfortably they are placed, if only on account of the unavoidable jarring. If it is in the summer the bees become greatly excited and in winter the wax of the combs being brittle breaks too easily so that one cannot insure against the breaking down of the combs during transit. When the bees are in simple straw skeps which are placed on their crown (or bottom upward), it is somewhat easier and more safe, but it is better to carry them in the manner previously described.

Rodheim, Germany, July 25, 1783.

[*To be continued.*]

EDITORIAL.

Some explanation is due our many subscribers and readers for regarding the delay in sending out the present number of our journal, and as during the past month we have decided upon important changes in relation to our business, it may not be out of place to devote this editorial to a brief review of the past history of our journal and a prospectus of our future plans.

Two years ago we issued the

first number of the APICULTURIST, with the intention to establish, if possible, an independent bee journal, and one that was in no way connected with the supply business.

Those with whom we have been most intimately acquainted will know that we have spared neither pains, time nor money in our endeavors to carry out our original designs, and, indeed, up to the last issue of our journal we have been true to our trust in the strictest sense of the word.

But few of our readers will ever know how hard and exhausting the unequal struggle has been, and it was not enough that we were obliged to pass through the fierce and trying ordeal through which all journals must pass during their early history, but also we have been compelled to contend with untold opposition on every hand.

Had we been abundantly supplied with capital at the start, or had the past two years been less trying to our brother beekeepers, our circumstances would have been materially changed; but, while all things considered, the growth of the APICULTURIST since its commencement has been unequalled by that of any other journal of a like character, during its early history, yet circumstances, over which we have no control, have compelled us to make the changes which we submit for your consideration.

In the future as in the past, we shall endeavor to conduct the journal in such a manner as to advance the cause of apiculture, and further the interest of the producers and consumers, for their interests are mutual.

We have learned that a bee-journal must be either directly or indirectly connected with a well conducted experimental apiary, in order that it may be well supplied with a proper amount and variety of information, valuable alike to the expert and novice, and that such apiary be supplied with all the modern appliances and fixtures necessary for conducting scientific and practical experiments and investigations in apiculture. It is also of vital importance that this bee farm be under the personal supervision of an expert who has mastered every branch of apiculture.

It has been our object and intention from the first to establish such an apiary in connection with the APICULTURIST, but until the present, this has for many reasons been impossible.

To organize such an enterprise requires a large investment of capital and this we lacked; again, it must be made self-supporting, which makes it necessary to dispose of its productions. This has led us to defer any change until we had given the experiment of publishing an independent journal a fair and thorough trial, which we have done until we have been actually compelled to make a change.

We entered into this work with a firm resolve to succeed, and with the assistance of our brother

beekeepers, to publish a journal that would fairly represent and protect their interests. Though there are those who have kindly written our epitaph, yet, in spite of this, the APICULTURIST still lives, and as we shall commence with the June number to issue 5,000 copies per month, it gives us great hope that it will not always remain that "youthful bee journal," but will in the near future take its place among the "more aged ones."

Study and experimental investigation, both scientific and practical, are the life of any vocation or industry, and as during the brief summer months it is utterly impossible for the honey producer to devote sufficient time to any experiments, to test them thoroughly it becomes necessary that we establish such experimental apiaries as those to which we have referred. Lacking these, apiculture in this country has not advanced as it should, but we look forward with great hope and anticipation to great and grand changes and improvements in this as well as in many other regards within the next few years. With this object in view, we have purchased from Mr. Henry Alley, of Wenham, Mass., the old "Bay State Apiary," established by him twenty-seven years ago, together with his entire bee and queen business, including his choice and valuable collection of breeding stock, the result of twenty-three years careful selection and breeding.

We have also been very fortunate in securing Mr. Alley's valuable services as superintendent of our queen-breeding department and while hereafter we shall make a specialty of the production and sale of the best bees for honey producing, yet we propose to confine our advertisements to the advertising department, giving our subscribers full benefit of our reading columns.

It is our purpose to test the value of all the various honey producing plants, and in order that we may do so, we have purchased in Wenham a fine estate of eight acres which we shall devote to this purpose.

We are now putting up a building which we shall use as an office, bee house and factory, and as soon as it is completed and the grounds are laid out, we shall give our readers an illustrated description of it. We propose in the future, to devote more time to our journal and to conducting, with Mr. Alley's assistance, various experiments in every branch of beekeeping, trusting that we shall be enabled thereby to solve many of the vexing problems over which there is at present so much discussion, and if our readers will send us careful descriptions of any experiments that they wish tested, we shall be most happy to make such tests, and report the results in our journal.

The APICULTURIST in the future, as in the past, will be published as an impartial and independent journal, so far as freedom of thought and expression of opinions are concerned.

Its pages are open to all its readers, and any communication, written in a fair, candid and considerate manner, that is intended to advance the interests of apiculture, will always be welcome even though it does not concur with our opinions and ideas.

With the June number, we shall commence our "Experimental Farm Notes," which will contain each month, reports of the results of the various experiments that we are conducting, together with such other items of interest as we may be able to glean. This will prove one of the most valuable features of our journal.

We shall also commence (in June No.) a series of papers entitled, "Instructions to Beginners," and shall commence with the most simple instructions, illustrating them as we proceed, and leading the novice on step by step, until (if he has carefully put into practice the teachings presented him) he has become an expert. These papers will prove especially valuable, because, as we proceed, we shall develop new and original ideas and methods that have never before appeared in print.

We also have in store for our readers a number of rich treats, and can assure them that if the APICULTURIST has in the past proven instructive or beneficial as an advocate of their interests, that with increased capital and facilities we shall be enabled to make it still more valuable.

We mean to have an interesting museum in our building, and trust that our readers will favor us with such implements, or other beekeeping fixtures as will prove interesting to those who visit the apiary, and we would here state that we shall always be pleased to welcome any of our patrons or beekeeping friends who may favor us with a visit.

It is due our friends, and those who have so kindly stood shoulder to shoulder with us through the heat and burden of the struggle through which we have passed, that we show a just appreciation of their efforts, not alone on our behalf, but also in the interests of the great cause of apiculture.

From the commencement of our enterprise, the articles and papers that have appeared in the APICULTURIST have been cheerfully and freely contributed as an evidence of the appreciation of our efforts, and no more instructive and valuable a collection of bee-literature ever appeared in print than can be found in volumes I and II of our journal.

We trust that in the future we shall be able to merit the trust and confidence that have been conferred upon us during the past two years, by our most prominent beemasters.

We enter a new field of labors, with the same firm and unwavering determination to live and carry out the plans that we have formed even though our idol has been broken.

Our past experience fits us for our new duties, and we shall endeavor to prove true to the interests of the beekeepers under all circumstances.

To those who may be inclined to question the propriety of our undertaking, or doubt the veracity of our first intentions, we would say "bide a wee" and await the results of this experiment, ere you pronounce your decision.

NEW OBSERVATIONS ON THE NATURAL HISTORY OF BEES.

By Francis Huber.

(Continued from p. 62, Vol. III.)

certain measure, changed their natural condition, and this circumstance possibly might have affected their instinct.[3]

Therefore to obviate every objection, I invented a kind of hive, which, without losing the advantages of those very thin, at the same time approached the figure of common hives where bees form several rows of combs.

I procured several small fir frames, a foot square, and an inch and a quarter broad; and connecting them together by hinges, the whole, like so many divisions, could be opened and shut as the leaves of a book. When using a hive of this description, we previously fixed a comb in each frame and then introduced all the bees which were required for the particular experiment.

Opening the different divisions in succession we daily inspected both surfaces of every comb; there was not a single cell where we could not see distinctly whatever passed at all times, nor a single bee, I may almost say, with which we were not particularly acquainted. Indeed this apparatus is nothing more than the union of several very flat hives capable of separation.

But bees must not be visited, in such a habitation, before their combs are fixed securely in the frames, otherwise the combs by falling out, may kill or maim the bees, or excite that degree of irritation as will expose the observer to being stung, which is always painful, and sometimes dangerous; but they soon become accustomed to their situation, and are in some respect tamed by it. In three days we may begin to operate on the hive: to open it, remove part of the combs, and substitute others without the bees exhibiting too formidable symptoms of displeasure.

You will remember, Sir, that on visiting my retreat, I showed you a hive of this kind that had been a long time in experiment and how much you were surprised that the bees so quietly allowed us to open it.

In these hives I have repeated all my observations, and obtained exactly the same results as in the thinnest. Thus I think already to have obviated any objections that may arise concerning the supposed inconvenience of flat hives.

Besides, I cannot regret the repetition of my labors; by going over the same course several times, I am much more certain of having avoided error; and it also appears, that some advantages are found in these which may be called *book* or *leaf-hives* as they prove extremely useful in the economical treatment of bees which shall be afterwards detailed.

Having now come to the particular object of this letter, the fecundation of the queen bee, I shall, in a few words, examine the different opinions of naturalists; next, I shall state the most remarkable observations which their conjectures have induced me to make,

[3] A single comb of very large dimensions, attached under the boughs of a tree, is said to be constructed by a species of bees in India.—T.

and then describe the new experiments by which I think I have solved the problem.

Swammerdam, who studied bees with unremitting attention, and who could never see the real union of a drone and a queen, was satisfied of its being unnecessary for fecundation of the eggs; but having remarked that at certain times, the drones exhaled a very strong odor, he thought it an emanation which operated fecundation by penetrating the body of the female. His conjecture was confirmed on dissecting the male sexual organs, for he was so much struck with the disproportion between them and those of the female that he did not believe their union possible.

Besides, his opinion concerning the influence of the odor was plausible, from affording a good reason for the prodigious number of males.

There are frequently fifteen hundred, or two thousand in a hive, and according to Swammerdam, it is necessary they should be numerous that the emanation proceeding from them may have an intensity or energy sufficient to effect impregnation.

Though M. de Réaumur has refuted this hypothesis by just and conclusive reasoning he has failed to make the sole experiment that could support or overturn it, which was confining all the drones of a hive in a tin case, perforated with minute apertures that might allow the emanation of the odor to escape, but prevent transmission of their organs. The case should have been then placed in a hive well peopled, but completely deprived of males, both of large and small size and the consequences observed.

It is evident, had the queen laid eggs after matters were thus disposed, that Swammerdam's hypothesis would have acquired probability; and on the contrary it would have been confuted had she produced no eggs, or only sterile ones. However, the experiment has been made by us, and the female remained barren; therefore it is undoubted, that the emanation of the odor of the males does not impregnate queens.

M. de Réaumur was of a different opinion. He thought that the queen's fecundation followed actual union. Having confined several drones in a glass vessel along with a virgin queen, he saw the females make many advances to the males; but unable to observe anything so intimate that it could be denominated their union, he leaves the question undecided.

We have repeated this experiment also: we have frequently confined virgin queens with drones of all ages; we have done so at every season, and witnessed all their advances and solicitations towards the males; we have even believed that we saw a kind of union between them, but so short and imperfect that it was unlikely to effect impregnation. Yet to neglect nothing, we confined to her hive a virgin queen that had suffered the approach of the male.

During a month that her imprisonment continued, she did not lay a single egg, therefore these momentary functions do not accomplish fecundation.

In the "Contemplation de la Nature," you have cited the observations of the English naturalist, Mr. Debraw, which, from their apparent accuracy, seemed at last to elucidate the mystery. Favored by chance, an observer, one day, perceived at the bottom of cells containing eggs, a matter apparently prolific, at least very different from the substance or jelly which bees commonly collect around their newly hatched worms.

[*To be continued.*]

EXCHANGES.

(Continued from p. 39, Vol. III.)

APICULTURE AND AGRICULTURE, BY T. J. M.— Let us next consider what proportion of those few pounds of honey could have found its way into the stomachs of the grazing stock if it had not been for the bees. It is known that during the whole time the clover or other plants remain in blossom, if the weather be favorable, there is a daily secretion of fresh honey, which, if not taken at the proper time by bees or other insects, is evaporated during the mid-day heat of the sun. It has been calculated that a head of clover consists of 50 or 60 separate flowers, each of which contains a quantity not exceeding 1-500th part of a grain in weight, so that the whole head may be taken to contain *one-tenth* of a grain of honey at any one time. If this head of clover is allowed to stand until the seeds are ripened it may be visited on ten, or even twenty different days by bees, and they may gather on the whole, one, or even two grains of honey from the same head, whereas it is plain that the grazing animal can only eat the head once, and consequently can only eat one-tenth of a grain of honey with it. Whether he gets that one-tenth grain or not depends simply on the fact, whether or not, the bees have exhausted that particular head on *the same day just before it was eaten*. Now, cattle and sheep graze during the night and early morning, long before the bees make their appearance some time after sunrise; all the flowering plants they happen to eat during that time will contain the honey secreted in the evening and night time; during some hours of the afternoon the flowers will contain no honey, whether they may have been visited by bees or not; and even during the forenoon when the bees are most busy, it is by no means certain that they will forestall the stock in visiting any particular flower. If a field were so overstocked that every head of clover should be devoured as soon as it blossomed, then, of course, there would be nothing left for the bees; but if, on the other hand, as is generally the case, there are always blossoms left standing in the pasture, some of them even till they wither and shed their seeds, then it must often happen that after bees shall have visited such blossoms ten or even twenty times, and thus collected one or even two grains of honey from one head, the grazing animal may, after all, eat that particular plant and enjoy his one-tenth of a grain of honey just as well as if there had never been any bees in the field. If all these chances be taken into account, it will be evident that out of the four or five pounds of honey assumed to be collected by bees from one acre of pasturage, probably not one-tenth, and possibly not even one-twentieth, part could, under any circumstances, have been consumed by the grazing animals—so that it becomes a question of *a few ounces* of fattening matter, more or less, for all the stock fed upon an acre during the whole season; a matter so ridiculously trivial in itself, and so out of all proportion to the services rendered to the pasture by the bees, that it may safely be left out of consideration altogether.

There is still one point which may possibly be raised by the agriculturist or land-owner: "If the working of bees is so beneficial to my crops, and if such a large quantity of valuable matter may be taken, in addition to the ordinary crops, without impoverishing my land, why should I not take it instead of another person who has

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by right, no interest in my crop or my land?" The answer to this is obvious. It is, of course, quite open to the agriculturist to keep any number of bees he may think fit; only he must consider well in how far it will pay him to add the care of an apiary to his other duties. No doubt, everyone farming land may, with advantage, keep a few colonies of bees to supply his own wants in honey; the care of them will not take up too much of his time, or interfere much with his other labors; but if he starts a large apiary with the expectation that it shall pay for itself, he must either give up the greater portion of his own time to it, or employ skilled labor for that special purpose; and he must recollect that the profits of beekeeping are not generally so large as to afford more than a fair remuneration for the capital, skill, and time required to be devoted to the pursuit. In any case, he cannot confine the bees to work exclusively on his own property, unless the latter is very extensive. When such is the case, he may find it greatly to his advantage to establish one or more apiaries to be worked under proper management, as a separate branch of his undertaking; but in every case, whether he may incur or share the risks of profit and loss in working an apiary or not, the thing itself can only be a source of unmixed advantage to his agricultural operations, and consequently, if he does not occupy the ground in that way himself, he should only be glad to see it done by any other person.

The position which is here sought to be maintained, namely, that the extension of apiculture cannot possibly be injurious, but must, on the contrary, be highly advantageous to agricultural interests, is deserving of the earnest consideration, not only of those more directly interested in the question, but of the public generally, because, if taken as established, it disposes of the only difficulty that has ever been raised in the way of an industry which is one of no trifling importance to any country, and which manifestly has had so much to recommend it in other respects. Its importance in an economic point of view must be admitted when we see what is being done for its development in other countries. In the United States, for instance, in no part of which are the natural climatic advantages more favorable, and in few parts so favorable to the industry as here in New Zealand, the production of honey is already considerably over 30,000 tons, representing a value of nearly a million and a half sterling per annum, and is increasing rapidly every year. In these islands, even in the present infant state of their population and land cultivation, there is nothing to prevent a production of two to three thousand tons, worth some hundred to hundred and fifty thousand pounds per annum, being attained as soon as the work is taken in hand by a sufficient number of qualified per-

sons, and being increased from year to year in proportion to the increase of population and cultivation, until it reaches, in course of time, at least ten times that amount, or something like the present production in the whole of the United States. This addition to the national wealth is made in the most unobjectionable form, the production of a healthful and agreeable article of consumption, derived from inexhaustible and constantly renewing natural sources, and collected through the instrumentality of an insect endowed with such wonderful instinct for the purpose. As an occupation beekeeping is highly conductive to a healthy condition, both of mind and body (the so much desired *mens sana in corpore sano*) of those engaged in it; and as an industry it does not look for any Government aid in the shape of subsidies, bonuses, or protective duties. In making this last remark there is no intention to cast any slight upon other branches of industry which may, admittedly with advantage, be fostered by Government help; but the fact that apiculture is independent of any such assistance is undoubtedly an additional argument in its favor. Private enterprise has been found sufficient to do all that was proposed, at the time of the Colonial Industrial Commission of 1880, to be done at Government expense (and much more beside) in the way of introducing new races of bees and doing all that is necessary to establish the industry on a proper basis. All this being the case, it is only right that apiculture should not be allowed to suffer in public estimation in consequence of mistaken views, or groundless prejudices, but that, on the contrary, it should be viewed, in the light of truth, as an important and most desirable industry, and at the same time the serviceable handmaid of both agriculture and horticulture.

Bay View Apiary, Katikati.

CORRESPONDENCE.

NEW YORK AND FLORIDA.

DEAR SIR:

In many sections of New York state the honey flow ceased during the month of August, which necessarily stopped brood-rearing which, together with the extreme cold winter which has just passed, will prove very disastrous.

The bees in two of the yards in New York state had access to buckwheat bloom during the fall which continued brood-rearing quite late in the season and to such we look for only partially successful wintering.

The bees from the south gathered but little after the month of August and no brood was the result. The bees, when liberated, dwindled very rapidly and continued to do so during the months of January and February which were unusually cold and damp for the climate, although brooding was kept up all winter in two or three combs.

About the first of March the weather changed making it more favorable for the working of the bees on the orange bloom, and taking a start at this time the bees have been booming ever since.

I spoke of observing the orange bloom for honey and our observations have led us to believe it a very highly developed flower, having rudimentary sepals, five pure white petals, long upright stamens which are sectionally united at the

base and assume a perpendicular position which bring the pollen-bearing stamens clustering directly around the sensitive pistil. The bee, in getting at the honey stored at the base, pushes its head in the hollow tube formed by the upright stamens which brings portions of its body against both stamens and pistil and cross fertilization is the result.

There is no family that is more sure or successful in securing setting of its fruit than the citron family depending entirely upon the bees for cross fertilization.

The bloom has lasted eight weeks which is something unusual. Our cold weather prolonged it several weeks and "the bloom" will continue two weeks yet, which will give us ten weeks of orange bloom for this season. The flow from this source some days is better than on others; the bees will fill every available cell with honey of a very light quality and the next day not quite as good. I don't think it quite equal to our northern linden.

If the theory of the fragrance in flowers is true in regard to evaporation of honey which is the fragrance in the air, there are tons of it floating away here. The saw palmettoes are reviving somewhat and indicate a more successful bloom since the weather has moderated.

This plant is very prominent in Florida vegetation covering, as it does, two-thirds of all the land in the state and the blossom when out is very rich with honey.

Wild grapes of some variety exist abundantly in swamps and lagoons, which will be in bloom the last of the present month and we all know its value as a honey producer.

The botanical names of many swamp vines which are good honey producers are unknown here, and so little notice of beekeeping and its resources for pasture has been taken that one can only learn by personal observation in this vicinity.

The cabbage palmetto, they tell me, is the linden of the south, but I cannot find the date of blooming. As yet it has made no advances in that direction.

Have taken some samples of fine white honey gathered in October of last season; the flavor is somewhat like our linden, but do not know the bloom that produced it. As my home yard was somewhat reduced in strength and being anxious to test the early spring thoroughly I secured some colonies a short distance away and have had the management of them since March 20. This yard commenced working on foundation the first of March and by the middle had seven combs of brood.

Have transferred this yard to shipping cases and divided them once and think I shall be able to divide again by the first of May. Our time is so much taken up in preparing to return north that we cannot investigate as we would like in swamps and lagoons for honey producing plants which one should know to work with confidence.

C. J. Ferris.

NOTES FROM NEW ZEALAND.

Ed. Am. Apiculturist:

The honey season is now about on its last legs and reports are coming in from the country of the season's work. Generally speaking the results are favorable and the yield of honey will be fairly good. In some places the crop was nearly all taken in the month of January. In the South Island I hear of unsatisfactory returns from some localities: no surplus and loss of bees to

a large extent, but from what cause I have not been able to ascertain. I think there is very little doubt that there is, at this moment, more honey in New Zealand than there has ever been before.

I mentioned in my last the difficulty the N. Z. Beekeepers' Association had experienced regarding the prices of honey. The retail dealers resented any attempt to regulate prices, and refused to buy. The committee of the Association then engaged hawkers and sent the honey to the people's doors, as an experiment, and it has succeeded very well. A good quantity has been disposed of at fair rates and the hawkers have made good wages. Comb honey in 1-lb. sections has found the readiest sale in this way.

The first annual meeting of the N. Z. B. A. takes place at Auckland on the 20th inst. and the first item on the programme for discussion is marketing honey, including the regulation of prices. The object which should be aimed at is to bring the amount paid by the consumer and that received by the producer closer together. I do not know how it is in your country but here the middle-men get the best of the business. I sold a case of comb honey in sections to a retailer at ten pence a pound and he sold it for fifteen pence. Cases are frequent where extracted honey was sold by the producer at four pence and afterward retailed at eight pence to a shilling. This is too big a margin, hence the hawking expedient.

Efforts are still being made to introduce the humble bee into N.Z. Twelve boxes containing queens recently arrived from England, but all were dead. Another lot is expected in a few days which, it is hoped, will turn out better. Mr. J. C. Firth, the gentleman who is paying the cost of these experiments, has done very much to assist the beekeeping industry in this part of the world. He is anxious to secure the fertilization of the red clover, as up to the present this has not been effected to any extent in N. Z. All red clover seed used here has to be imported in consequence. The matter is really important and worth accomplishing if it should cost a good sum of money and trouble.

NEW ZEALAND CORRESPONDENT.

HARD WINTER ON BEES.

DEAR SIR:

The present is the hardest winter on bees, of which I have any recollection. The winter of 1880–1, notorious as a cold winter in the southern states, commenced early and gave us steady cold weather during December and January, and began to break up in February. But this season we have the hardest part of the winter in February, and for this reason our bees are suffering severely.

It is true my bees have had as many flights in the open air as is necessary for their health, but the sudden changes of weather have wrought severe mischief with unprotected colonies. The consumption of stores has been very great, and the weather is too cold to look after their wants. This morning, Feb. 19, the mercury went down to zero for a few hours, and day after day old hoary winter clasps the "sunny south" in his icy embrace. If there is not a change soon I am sure that starvation will reduce the number of my colonies very materially.

My bees had stores enough to carry them through an ordinary winter, but this is not an ordinary winter by considerable. Feed them, you say? Yes, that is good advice; but how am I to go through one

hundred colonies this cold weather to find out the starving ones? They will be fixed up all right when the weather moderates; that is, those that do not succumb to starvation before the change comes.

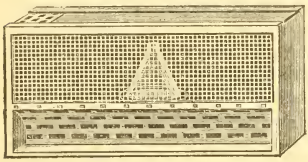
G. W. DEMAREE.

Christiansburg, Ky.

THE DRONE TRAP AND HOW TO USE IT.

DEAR SIR:

IN compliance with your request, I have prepared the following description of my method of using the "Drone Trap" of which the accompanying cut is a good representation. The "trap" has many uses, and I find it indispensable in my own apiaries.



The accompanying cut represents the drone trap, and shows the perforated metal entrance, the tin slide, the perforated metal at the top, through which the workers, that enter the trap, pass out, and also the cone through which the drones or queens pass into the trap. The front of the trap, as will be noticed, is covered with wire cloth.

In using the trap place the open side towards the entrance of the hive; the tin slide which forms the top need not be opened except when a queen is to be released, or drones are to be removed. Arrange the entrance so that all the bees must pass through the zinc.

The trap should be placed at the entrance several days before a swarm is expected. In case a swarm issues and you wish to put the bees in a new hive, wait until they begin to cluster upon some object, then take the trap and place it near them. It can be held in place by being fastened with a strong string and attached to the limb of the tree. When the bees are quiet, hive them in the usual way, releasing the queen as the bees pass in. In case the bees miss the queen and return to the hive without clustering, proceed as follows: Remove the parent stock back, or to one side and put the new hive on the stand in place of it; as the bees run in, release the queen by drawing the slide back. In case the bees get confused and attempt to enter the wrong hive (which I think will hardly ever occur), remove the trap and there will be no trouble.

When a swarm has issued, examine the trap to find the queen. If she is in it, place the trap as near the bees as possible while they are flying, when they will settle upon it and may be hived at pleasure. The trap need not be removed from a hive that has cast a swarm, as the queen before she has become fertile can pass through it. By this you will see that your queens can be mated by the drones of any particular strain in the apiary.

To those who rear queens the trap is indispensable. For instance: suppose one has 100 colonies of black bees in his apiary and 10 colonies of pure Italians. Now if several of the Italian colonies have cast swarms, each one of which has left a fine lot of cells which one wishes to save in order to use the queens that come from them to replace some inferior ones in the impure colonies, this can be easily and quickly accomplished by the following method: remove the queens from the colonies and

at the *same time* insert the cells *when matured.*

Put a trap at the entrance of all hives excepting those having *pure Italian drones*, and every one of the young queens will be purely fertilized, and the apiary rid of thousands of useless drones.

Then again the trouble and expense of nucleus hives will be saved. This is the easiest, simplest and best way to Italianize an apiary of black bees.

If your neighbors have black colonies, arrange with them for placing the traps on their hives, as there can be no possible objection to so doing.

HENRY ALLEY.

Wenham, Mass.

CANADIAN DEPARTMENT.

R. H. HOLTERMANN, EDITOR.

—Reports still coming in of bees not properly cared for in the fall, starving and being deficient in stores. Others appear to be doing well. Early in the month bees had an excellent opportunity of having a cleansing flight, to-day (April 17) thermometer is 10° below zero. If a severe winter is followed by a good honey season our prospects are excellent.

—Ontario Agricultural and Experimental Union, Ont. Agricultural College, Guelph, Second Day, March 13, 1885. Union resumed at 9.30. Mr. R. F. Holterman gave a paper on the importance and growth of beekeeping, showing how only a few years ago the appliances for beekeeping were of the most primitive character while now by the use of the movable frame hive, honey extractor, comb foundation and other modern inventions it has become less hazardous and the profit can be calculated with as great certainty as any other rur l pursuit. He pointed out the importance of bees as fertilizers of fruit, clover, etc., and as a source of wealth to the country. The interesting discussion which followed was participated in by Rev. W. F. Clarke, J. Ramsay, Mr. Rennie and others. The questions of foul brood, hibernating, spring dwindling, etc., were brought up, but the talk was shut off to make room for other papers. The project of a beekeepers' convention was moved and may be proceeded with.—"*Guelph Daily Mercury.*"

—The Norfolk beekeepers' convention was held at Lynville, Ont., Mar. 7. The attendance was somewhat meagre, but the discussion of form of hive, weight of foundation, and other important questions were entered into. The next meeting will be at Waterford the first Saturday in June at 10 A. M. A full day is expected and a profitable time.

—Martin Emyh of Holbrook, Ont., attended the beekeepers' convention at New Orleans. We have not yet interviewed him. Wax is selling at 39 cts. Extracted honey per cwt., 10 cts. per lb. Combs 18 cts., lb. sections wholesale.

NOTES AND QUERIES.

—With our June number, we shall commence to issue a circulation of 5000 copies per month of our journal. This will make it a

most valuable advertising medium and it will pay all those who have goods for sale to correspond with us as we can offer first-class inducements.

— Promptness in attending to business correspondence, is a valuable feature, and while in the past we have been overworked, and sometimes have been obliged even almost to neglect a portion of our private correspondence, yet as soon as we get arrangements completed this difficulty will be obviated.

— We have now enlarged and improved our little "Beekeeper's Companion;" it also contains a likeness of Mr. Henry Alley, superintendent of our queen-rearing department. Please send for a few copies (sent free) and distribute them among your beekeeping friends.

— We should be pleased at any time to receive from our readers any bee hive, implement or fixture designed for use in the apiary, which we will place in our museum, and also bring to the notice of our readers any valuable features that it may contain.

— Do not fail to send us any questions that you may wish us to answer through our question and answer department.

— We are having here in the north an unusually trying and backward spring. Keep your colonies snug, well packed and warm, and do not on any account, spread any of the combs so long as there is any danger of these sudden changes in temperature. Bees will care for more brood, and increase more rapidly if the size of the brood nest is adapted to the size of the colony, so all the brood can be covered and kept warm, even during cold nights. At night and during the cold portion of the day, allow the bees only a small entrance. It will pay to attend to this. Enlarge the entrance somewhat when it is warm so as not to bother the bees.

— Our experience during the past winter only more fully convinces us that bees winter best in chaff-packed hives, and on summer stands, and that colonies so wintered prove more hardy and enduring, than those wintered in the cellar, and during such a spring as we are now having, there is less loss in bees with the former than with the latter. Where one has two apiaries some distance apart, it is well to use hives so constructed as to take two colonies, the brood nest being large enough to take from fourteen to seventeen frames, and a thin division board should be placed between the colonies. In this way, the two colonies form but one cluster instead of two, and the heat is economized. For various reasons, this will prove very beneficial. We have tested this very thoroughly and speak from experience.

— After July 1, 1885, the weight of a letter which now can be sent for two cents, will be increased from one half ounce to anything under one ounce.

— During the month of February, 1885, $27,000 worth of honey was imported into Great Britain.

— A short time since we received from the Stanley Bros., of Wyoming, N. Y., one of their new four comb honey extractors, and so far as we have been able to test it, we can truthfully say that it works like a charm, and if when

submitted during the honey season to severer tests, it prove equally satisfactory, it will surpass all others in value.

—For some time past, Mr. J. E. Pond of Foxboro, Mass., has been rather unwell, and we regret to learn that he is now confined to his bed by rheumatism and heart disease.

Still later. We are pleased to learn that Mr. Pond is improving and is able to be about.

—We would acknowledge the receipt from Mr. A. E. Bonney, Adelaide, South Australia, of the fifteenth annual report of the committee of the South Australian Chamber of Manufactures, from which we have taken the report on bee farming, that appears on another page, together with the report of the committee on the same subject, and also the following interesting note from the address of the chief secretary.

"I am very pleased to find that a considerable amount of attention is being paid to the industry of bee-farming, and I hope that the enterprise will be a successful one. I believe that this is a fine country for bees, and that the insects thrive well here. There is a large quantity of honey to be gathered in the colony, and when we have an industry of this kind it is very desirable that we should encourage it."

—A London publication has a paper on "The Emotional Language of Bees." We had always supposed the language of bees to be very humdrum, though we were aware that there was generally a good deal of emotion when they began to gesticulate.

[Yes: and their remarks are generally pointed and bear considerable weight. Ed.]

—Dr. C. Spencer has been prying into the business secrets of the bee, and thus tells of what he has learned: "In my observatory hive one cell was built against the glass, and that afforded an excellent opportunity of seeing how bees deposit honey in the cell. First, a bee deposited a thin coating of honey upon the base of the cell, making a sort of varnish, as it were, to the base of the cell. The next bee that came with honey raised up the lower edge of this film of honey and forced its honey beneath; the next bee did the same, and this film acted as a kind of diaphragm, keeping honey in the cell. When the cell is full enough to be sealed, the bees commence contracting the opening with wax until there is only a small hole left in the centre, when they appear to take one little flake of wax and pat it down over the opening. At any time during the process of filling the cell the honey could be withdrawn with a hypodermic syringe, and the 'diaphragm' left hanging in the cell."—*Transcript.*

—It may be interesting to bee masters at this season of apiarian activity to know that M. Jonas de Gélieu, a pastor at Neufchatel, Switzerland, in a work translated into English long ago under the title of "The Bee Preserver, or Practical Directions for Preserving and Renewing Hives," affirms "that when two or three distinct hives are united in autumn they are found to consume together scarcely more honey during the winter than each of them would have consumed singly if left separate." In proof of this singular result the author sets forth a variety of experiments, all of which led uniformly to the same conclusion. He shows positively that of upward of thirty hives six had their population thus doubled, and consumed no more

provisions during winter than a single hive, and that, so far from the bees suffering any diminution, the doubled hives generally sent forth the earliest and best swarms. The translator of M. Gélieu's work states that he practised in Scotland most of the plans recommended in the original publication with the same effect.

INTERESTING NOTES.

We clip the following from the Fifteenth Annual Report of the Committee of the South Australian Chamber of Manufactures, Adelaide, Australia.

Mr. A. E. Bonney, under date of July 17, 1884, writes to the secretary of the Chamber of Manufactures:—I am pleased to say that during the past season a great impetus has been given to beekeeping in this colony; the movable comb hive and improved systems of management are rapidly superseding the old boxes. There is no doubt that much of this improvement is due to the Chamber taking up the subject; the meeting held on the 8th February last in connection with this industry appears to have at once created a large demand for modern hives and appliances. Also, the recently formed Beekeepers' Association should do much for the advancement of apiculture in South Australia, and it is expected that the movement will be well supported.

The Italian bees imported by the Chamber from Queensland have done well since they were intrusted to my care last December. The original colony was divided into three: two of these in Langstroth hives were sent to Messrs. Buick and Turner, of Kangaroo Island, the third remaining in my own apiary. Pure Italian queens were given to Mr. Justice Boucaut, Messrs. J. Robertson and W. Stevens, who successfully introduced them to colonies of black bees. In order to keep the Italians pure on Kangaroo Island all the black bees have been removed.

Many persons have entered enthusiastically into scientific beekeeping, and the nuclei of what are intended to be extensive apiaries are already established. At present the largest venture of the kind is at Kent Town, where upwards of one hundred hives are in use, and it is expected to more than double that number during next summer. This apiary is under the care of Mr. Filbig, who is a recent arrival from Europe and a very able beemaster. He has adopted the German hive and Italian bees with satisfactory results.

I think I am correct in saying that, while the majority of persons using ordinary box hives complain of the bad honey season last summer, and the consequent loss of bees, those who have adopted the movable comb hive are jubilant at the large amount of surplus honey they secured. In my own neighborhood there has been an uninterrupted flow of honey from the end of February until the present time, and after this, my third season's experience in practical beekeeping, I am more than ever convinced of the magnificent honey resources of South Australia. The extreme dryness of our climate appears to cause the flowers to secrete a thick rich honey which for flavor can hardly be surpassed in any part of the world.

The valuable report on the "Bee Farming Industry," by Mr. A. E. Bonney, which was presented the previous year, attracted a large amount of attention, and during the past twelve months satisfactory

progress has been made towards placing this important rural industry on a more satisfactory basis. A well-attended meeting was held in the hall of the Chamber, when a paper on "Modern Beekeeping," by Mr. Bonney, was read, and the new frame hives and other beekeeping apparatus were explained by Messrs. Bonney, Weidenhofer, and Robertson, to the evident interest of the public. The Chamber has also become a subscriber to the English, American, and Australasian bee journals, so that the best current information relating to beekeeping is now accessible to the public at the office of the Chamber. It will no doubt be remembered that at our last annual meeting the Hon. R. D. Ross, M.P., drew attention to the importance of introducing the Ligurian bee, which is not only valuable as a honey producer but also for fructifying clover and other deep-tubed flowers; and an opportunity offering to obtain a colony of Ligurian bees from Queensland, the Chamber willingly availed itself of it. Money was accordingly voted for the purpose, and the colony arrived safe and was placed in the care of Mr. Bonney, who has from month to month reported satisfactory progress. An attempt has been made, by the withdrawal of the black bees from Kangaroo Island, and the placing of two colonies of pure Ligurians there, to thoroughly establish these in that locality, from which it is hoped supplies may in future be drawn. Two colonies have been placed, one in the care of Mr. Buick, of American River, and the other in care of Mr. Turner, of Smith's Bay; and other Ligurian queens, raised from the original importation, have been distributed to Mr. Justice Boucaut, Mr. W. Stevens, and Mr. J. Robertson, from whom satisfactory reports respecting their interesting charges have been received to the gratification of the Committee. Although the queen-rearing was not quite so successful as Mr. Bonney could have desired, the Committee believes that substantial progress has been made in advancing the industry. The Chamber has also been glad to assist in the initiation of a Beekeepers' Association, which has been organized with a view to secure an interchange of experience and opinions of apiarists on matters of mutual interest.

REPORT OF THE NORTH-EASTERN BEEKEEPERS' ASSOCIATION.

(Continued from p. 71, Vol. III.)

REARING QUEENS.

In the absence of Mr. Alley, who was to deliver an address on "Rearing Queens," Capt. Hetherington was called upon. Mr. H. stated that he had tried the experiment of introducing young and fertile queens to a colony in summer, in order to prevent swarming, but it had utterly failed. He had also experimented with introducing queens in cells, protected by a film of foundation, which was wrapped around them, and during the first season, had succeeded in introducing two or three hundred successfully; but on further testing failures resulted.

He did not wish to recommend anything new that had not been tested more than one season. Usually the man with the least experience was the most positive one in these conventions, or as a writer for the periodicals.

Messrs. Locke, Dickinson, Goodspeed and others, then discussed the subject resulting as follows:

To rear good queens, first select strong populous colonies in the spring, and take the best of care of colonies from which, both the brood for cells and also the drones are to be taken.

The drone mothers should be select-

ed with as much care as the queen mothers, and the drones exert fully as great an influence on the progeny, as do the queen mothers. Brood from which the queens are to be reared, should be given to the bees when just three days old, from the laying of the egg. Bees that have been kept queenless, and confined without brood for almost twelve hours, rear the best queens. Then cells should be cut out when the queens that are in them are just twelve days old, and are moving about in the cells. After cutting them out, remove them to queen nursery, and hang them in the brood chamber of a colony that is queenless.

To separate two cells so built that they cannot be cut apart without injury to them, take a warm knife and cut through the wax between the cells on each side down to the cocoons. And then taking the cells between the thumb and forefinger of each hand, gently roll them and the cocoons will separate when a piece of foundation can be pasted over the uncovered portion, so as to protect the cocoons. This will save cutting into the cells.

When queens are about to emerge from the cells, they gnaw a small aperture, and then reach their tongue out through this aperture, when the attendant bees feed them. This seems to strengthen the queens and better fit them for the labor of cutting off the cap of the cell. In view of this, it is well when putting the queen cells into the nursery (not lamp nursery) to put in the layers, four or five attendant bees providing food for them.

An article from the *Sun* was read, wherein it was stated, that the queens of a certain beekeeper had laid fertilized eggs, without having left the hives to meet the drone, the drone larvæ being introduced into the royal jelly just after the queen cell was sealed. Mr. Goodspeed had tested this, but was not sure of the results. He however protested against tampering with the cells.

DOLLAR QUEENS—THEIR EFFECT ON THE STOCK OF THE COUNTRY.

Messrs. King, Goodspeed, Betsinger, Dickinson, Root and others, discussed this subject, resulting as follows:

The cheap queen business is detrimental, and has done an immense amount of harm. Oftentimes they are not ever worth the price paid for them; but are culls sent out, without any test. No queen breeder can test a queen properly, unless she has been kept at least one season.

Dollar queens, so called, were just as good as higher priced queens, sold by the same parties; and were more profitable to the general beekeeper than higher priced ones. One must however deal only with those who are known to be honest and careful breeders.

Queens should produce progeny, with three-banded workers. The color of queens was brighter when bred in warmer climates. Queens should be reared in full colonies. Mr. Betsinger stated that a queen that would duplicate herself would always produce three-banded workers. A queen that would not produce a three-banded worker was a hybrid.

The workers in almost every instance take after the mother. Mr. Betsinger's statements called forth quite a discussion regarding the purity of queens.

BEST ARRANGEMENT FOR COMB-HONEY.

Several parties had brought with them, for exhibition, various arrangements for securing comb honey; and these were described and commented upon.

THURSDAY MORNING.

After opening the convention, Pres. Root announced the following standing committees:

Resolutions, C. G. Dickinson, Arthur Todd, and J. Van Deusen.

Exhibits, Ira Barber, I. L. Schofield and Geo. H. Knickerbocker.

Question Drawer, N. N. Betsinger, A. J. King and Geo. W. House.

INTRODUCING QUEENS.

S. M. Locke then read the following paper on the theme of Introducing Queens."

The introduction of queens is, with me, a difficulty of the past, as I have long since become so familiar with their habits, and also the habits of the bees, that I no longer experience any trouble. We introduce thousands of virgin queens every year, with no loss when care is used, and but very few even when done hurriedly. I have had a number of virgin queens caged in one hive, and have liberated one at a time. The first would usually mate the first or second day, and as soon as mated I

would cage her again, and liberate another, and so on. By this means, you could, in a few days, have five or six virgin queens all in one hive mated, and ready to be disposed of as circumstances required. Either nuclei or full colonies can be used; or if there is a short season when you do not care to have your old queens lay, cage some of your virgins in the hive, and before liberating them, cage the old one, proceeding as above, thus securing many fine queens, either for sale or superseding purposes. A queen should not be allowed to remain in a colony, till such time as she is so old and feeble as to require crutches to get around. Rather than allow that I would prefer to have two queens laying in one hive at once.

Young queens just hatched, or hatching, may be introduced at once into any colony, or any queen may be introduced *at once*, by my chloroform system, which has been fully explained before. Caged queens should be introduced with care and judgment, and an expert can tell just when a queen will be accepted, and can introduce one successfully, while the novice is liable to have her destroyed, as he is liable to liberate her if the bees are balling the cage as if they were feeding her, not knowing the difference. A queen's actions has much more to do with her acceptance, or destruction, than has her peculiar scent. I can introduce any strange queen successfully, totally disregarding her scent, if I can only get her to behave herself as she should. Why will bees accept a young, freshly hatched queen, having a different scent? Because it has no fear, and acts accordingly. Instead of trying to invent new ways of introducing matured queens, learn to make them act like young ones, and the difficulty is over.

The subject was then discussed by Messrs. King, Locke, Salisbury, Todd and others, resulting in the following:

To introduce queens, both laying and virgin, calls for a knowledge of the nature of the insects, and great care in performing the operation. Bees will accept a queen much more readily, if introduced immediately after the old queen has been removed, and before the bees recognize their loss.

Queens, and especially virgin queens, can be more successfully introduced when the bees are gathering honey, than in a time of dearth. If one is obliged to introduce queens when the bees are gathering no honey, it would be well to feed the bees, placing the feeder on the top of the frames.

While virgin queens just hatched will almost always be readily accepted by a queenless colony (one that has been queenless for two days, or more) yet it is very difficult to introduce one that is five days old to the same colony. The proper and careful use of tobacco smoke in introducing virgin queens was strongly advocated, as the best and safest means, whereby it could be accomplished; although some of the most prominent members opposed it for various reasons. For introducing laying queens, the majority seemed to favor the "Betsinger cage." To introduce with this cage, remove the old queen, and then place the new queen on a comb containing hatching brood. After which place the cage (a cage formed of wire-cloth, in the shape of the tin cover to an oblong box, say 3×4 inches, with sides ⅞ of an inch deep) over the queen, passing the sides down into the comb until they reach the septum or foundation. Then cut an ⅛ inch cage from the opposite side, using for this purpose the small blade of a penknife, or other small knife, leaving the plug which is formed, hanging loosely in the opening, so that it can be easily removed by the bees. The beauty of this method is, that the bees on finding that their queen is gone, will immediately commence to release the new queen, and after gnawing an opening around the plug, one bee will find his way into the cage and is followed by others, who at once present their antennæ and tongue, feeding the queen, and showing their pleasure at being able to release her. Soon finding herself at liberty, she will quietly leave the cage, and enter upon her duties as mother bee. Those who advocated this method gave the most convincing evidence of success.

MARKETING PRODUCTS.

This subject was thoroughly discussed, Messrs. King, Pierce, Bacon, Todd, Root, Locke and others, taking part.

Unity of action, and the establishing of proper relations between the producer and consumer, whereby a demand may be created, and prices made staple, were strongly advocated.

Mr. King referred to the British honey organization for example. The condition of the honey market was considered, and it was shown that

California had been fortunate in securing an unusually large crop this season, which was put on the market at the same time with our own and at low prices. This together with the general hard times has brought about a glutted honey market. It was generally conceded that the beekeepers themselves *must* work unitedly, in making up a demand for their own honey, disposing of as much of it as possible, in home markets. To do this, it was suggested that bee and honey exhibits be held in connection with our county fair, and every means used to educate the people as regards the value and uses of honey, together with the methods by which it is produced.

Mr. King spoke at length on the question of Cuba, its resources as a honey-producing country, and stated that while the honey was fine, and the flora abundant, yet the people there were so slow in adopting new ideas, that competition need not be feared at present.

Some of the members, however, referred to the introduction into Cuba of all the modern appliances, and sending there of experienced apiarists together with the endeavors that were being made to foster and advance beekeeping there. It was also stated by many of the members, that in their experience it had proven unprofitable to send honey to the commission markets, and that they would have received far better prices, had they sold it at home.

Neat packages, labels, etc., had much to do with the sale of honey.

WHAT CAN BE DONE TO INCREASE THE DEMAND FOR EXTRACTED HONEY.

Messrs. Ross, Pierce, Van Deusen, Locke, King, Benedict, Todd, Betsinger and others, discussed this subject, and the general opinion concurred with those relating to the sale of comb honey. Work up a home trade first, next work your honey into the hands of those who use sweets in candies, medicines, cakes, canned fruit, etc., and in fact wherever honey can be used to advantage; also have some neat pamphlets printed to give away with the honey. Mr. Todd said, do not put honey in tin cans, as the natural acid will attack the tin as it does in tomatoes, which has already ruined the canning of the latter article. Use only glass.

COMB FOUNDATION.

Capt. Hetherington heartily endorsed the use of comb foundation in brood nest and in the boxes, in the latter not more than eleven feet to the pound. Mr. Doolittle had found that if the bees were filled with wax secretion, they used that instead of the foundation. That made by Mr. Van Deusen, the flat septum, must be overhauled by the bees before they could use it. Save the wax that the bees will inevitably secrete, and you will not need the comb foundation. If you give them both, they must waste one or the other.

After some further discussion the matter was dropped.

Mr. Locke read a communication from Messrs. Thurber & Co. of New York City, asking the association to sign a protest against the proposed "Spanish Treaty."

This subject called forth considerable discussion in which Capt. Hetherington, Messrs. Locke, King, Todd, Dickinson and others, took part; the majority favoring the signing of the protest.

A motion was made by Mr. Dickinson that the protest be commended by the association, and the Secretary be installed to affix the names of all the members of the association.

After discussing the matter for some time, without arriving at any definite conclusion, the meeting was adjourned to meet in the afternoon.

Convention called to order at 2 P.M., President Root in the chair. After considerable discussion regarding an objectionable clause, the following resolutions were adopted.

To The Honorable, the Senate of the United States—WHEREAS, A large number of persons have been encouraged to engage in the bee business by the present duty of two cents per pound or twenty cents per gallon on imported honey; and,

WHEREAS, By the introduction, into the island of Cuba, of the improved appliances and methods of modern beekeeping, said island, which possesses the richest honey-producing flora in the whole world, will shortly become under the existing tariff a formidable and successful rival of the United States in the production of choice comb and extracted honey; and,

WHEREAS, The confirmation of that article in the so-called *Spanish-American Treaty* which entirely removes all

duties on Cuban honey imported into this country, will seriously cripple if not entirely destroy an industry still in its infancy (gathering only about fifty million pounds yearly) but which under the same fostering care extended to other industries is destined to become a business of immense proportions.

Therefore, We, the beekeepers of the United States, petition our honorable representatives in the U. S. Senate that the article admitting Cuban honey free into this country be stricken out of the Spanish-American Treaty.

GEO. W. HOUSE,

P. H. ELWOOD.

The following committee was appointed to present the above resolutions to the beekeepers of the United States, and also to the Senate and House of Representatives, viz., Messrs. Todd, L. C. Root, Vandervort, Betsinger, Locke and Elwood.

The secretary was instructed to have printed copies of the above resolutions, and to send them to beekeepers, and interested parties throughout the United States, and especially to those who had previously received another circular issued by the association.

ELECTION OF OFFICERS.

An informal ballot was taken for president, which gave Mr. L. C. Root the majority—41 votes. This was followed by a formal ballot, which gave Mr. L. C. Root 41 votes and elected him president.

Mr. L. C. Root was by acclimation unanimously made president. Secretary House was instructed, and did cast the vote of the association for Chas. Dickinson as vice president.

Mr. House stated that he should positively decline reëlection as secretary, as he had served in that capacity for a long time, and he thought there were others who should share the burden.

A formal vote was then taken, which resulted in the election of Mr. Frank I. C. Berick, as secretary. Mr. I. L. Schofield was elected treasurer.

President Root then presented his annual address as follows:

THE HONEY MARKET.

The one great interest which comes before us most prominently, demanding the attention of all who are in any way interested in the production of honey, is, How shall we create a more general demand for our products and establish a permanent and well regulated market for the same?

It may be well first to notice some of the causes which have brought about the present condition of the market that we may be better able to work intelligently in placing it upon a better basis.

Twenty-five years ago, box honey in two to eight comb boxes, weighing from five to ten lbs. each, would wholesale readily at from 30 to 40 cts. per lb. and retail in proportion.

With this advantage, had the minds of beekeepers generally been fixed upon the idea of establishing a reliable and permanent honey market, and had they worked as faithfully to that end, as they have in the direction of producing a greater quantity of honey, we should not have the unsettled market of to-day.

Besides, if we had kept this matter fully in mind in all of its bearings, we should have found that by producing less surplus honey in better shape, we should have experienced far less loss, particularly in wintering.

There are many who have lost in bees during the winter much more than they have gained by their efforts to produce a large amount of surplus.

I do not fail to recognize the grand progress which has been made during the past in the production of honey, and yet I repeat that far too little attention has been given to fostering and encouraging a demand for honey which would sustain a permanent and substantial market.

We have had by far too many pet hobbies and too much selfishness to be gratified. We have not worked with enough unity and with enough willingness to make such sacrifice as would result in the greatest good to the greatest number.

Our bee-literature has been seriously at fault as an educator. Books have been written and journals have been published from selfish motives. The tendency has been far too great in the direction of urging everybody indiscriminately to engage in beekeeping without first qualifying themselves as in any other pursuit.

Beginners have been led to desire to produce a large amount of honey, rather than to pursue well-considered and cautious methods which would secure a less quantity in better marketable form.

The motto has too frequently been "cheaper, rather than better, products," one individual even being injudicious enough to assert that we can afford to produce liquid honey at five cents per pound. This savors too much of the teachings of some whose names are sometimes found under the heading of "Humbugs and Swindles."

I need not dwell more at length upon the mistakes of the past. All who are informed know of them only too well. We have been too forcibly reminded many times of the confusion from which we must all suffer.

Now, in the direction of bringing about a needed reform, let me suggest that the one thing at which we should aim in an unselfish, thoughtful and energetic way is a *higher standard of our products.* This, I believe, should be our motto. And our standard should be high. We should not be satisfied with anything less than the *best.* We should remember, that from the very earliest history of the world honey has been considered a desirable article of food. We should also keep in mind the fact that it is the only entirely natural saccharine product that we have given us as a food. It is secreted in the blossom, gathered by the bees, and stored in the combs ready for our use, without undergoing any change or process of manufacture by man. When properly cured and kept under favorable conditions it will not granulate.

To furnish this natural and desirable product with its delicious flavor pure and unchanged, whether in the comb, or freed from it, is the first and highest standard which can be placed before beekeepers at this time, and in my opinion will do more towards establishing permanency in a honey market than any other one thing.

It is very apparent that we have made great progress during these years, in neatness and form of package; and while this is true, it is also a fact that we have made many sad mistakes which have resulted harmfully.

The box of earlier date was glassed before it was filled and, as a rule, was left upon the hive until late in the season. The effect of this was, that the boxes were thoroughly sealed with propolis. The honey was perfectly cured, and was covered with an extra coating over the capping of the cells, protecting it more entirely from moisture. If any cells were left partly filled and uncapped, the honey was removed by the bees.

With such products we should hear no complaints of honey dripping from the boxes, souring in the comb, or presenting a watery appearance.

So long as we find honey offered for sale, partially sealed, produced without separators, without being glassed, improperly cured, and in leaky packages, we need not expect a substantial market.

We must conform in some degree to the earlier methods. We must use separators to secure straight combs, be sure it is well sealed and firmly secured to the boxes, have it well cured, nicely glassed, and cased in a neat and substantial manner in a standard package.

One of the oldest and most reliable honey dealers in New York told me recently that much confusion arose from the irregularity in sizes of cases. The cases should never contain but one tier of boxes. Those for two-comb sections should hold twelve, and for one lb. sections, twenty boxes to the case.

I regret the necessity of mentioning the most unfortunate point in connection with this subject, namely, that we have ever heard the name of anything besides *pure honey* mentioned in connection with our pursuit. The minor good that has ever come to producers of honey by using any food besides pure honey is as nothing, compared with the great misfortune which has resulted from associations connected with the practice.

I have not intended to take up the minor points of this subject, which are being freely discussed in our various journals, but rather to offer some suggestions which may stimulate more full and thorough investigation.

On the question of compelling recognition from our legislatures, and agricultural societies, several addresses were made, Messrs. Hetherington, Root, Clark, Betsinger, Locke, and others, taking part. It was decided that united effort was necessary, and Capt. Hetherington in corroboration of this gave his experience in working up an exhibition at the Centennial. The beekeepers did not respond and join him as they should, and which, had he not worked hard, would have resulted in entire failure. It was decided that beekeepers' exhibits should be connected with every agricultural fair, etc. The agricultural societies will welcome us when we do our part. There is no need of compelling the agricultural societies to do *their* part; when *our* associations are so organ-

ized that we can act unitedly, then we can make displays and exhibitions that will find a welcome anywhere.

Let us do our part, and then we shall have something to offer the agricultural association, when we appeal to them.

FOUL BROOD.

Mr. H. N. Betsinger opened the discussion on this question, as follows:

He stated that "atmospheric changes" were the cause. The cure of the disease could only be effected by carrying out certain laws.

Carbolic acid had been suggested as a cure; but in his opinion, it was worse than the disease. Fermented honey or pollen would cause the disease. He had learned by experience that if the fermented honey alone were fed, in less than ten days foul brood would appear. Such fermented honey was oftentimes found in the blossoms. In the cold, wet seasons, the disease prevails, because such seasons are favorable to fermentation.

In dry seasons foul brood is never found. A complete cure would be found in simply feeding salt. Make a strong brine, immerse the combs over night, and it will positively cure. As a preventive to the disease, keep a little weak brine in the yard, where the bees can get at it. The speaker fills a nail keg partly with sawdust and salt and water; and enough will ooze through the staves for the bees to get.

The discussion following Mr. Betsinger's remarks were extremely animated, as the idea of treating our colonies to brine was considered by many an original and questionable one.

That the saline or acid properties, gathered from newly-exposed earth mine, stagnant pools, etc., had been utilized by the bees in feeding, freeing the honey as it came from the flowers, of all that was injurious, was taught by J. L. Christ (author of the old German work, being translated and published in the "American Apiculturist") over one hundred years ago. Also, and recently, the Germans have discovered that the poison of the bee is a powerful antiseptic, and will kill the spores of the Bacteria. Mr. Betsinger, nothing daunted by the opposition, offered $25.00 for a case of foul brood, that he could not cure with salt, provided the competing party would give him $25.00, if he did cure it.

Mr. Dickinson also offered the Association $25.00 if any person would, under Mr. Betsinger's instructions, produce a case of foul brood, by feeding sour pollen or honey.

On motion of Mr. Root, a collection was taken to defray incidental expenses. Convention then adjourned, to meet at 7 o'clock.

THURSDAY EVENING SESSION.

THE ADVANTAGES AND DISADVANTAGES OF MAKING COLONIES QUEENLESS TO PREVENT SWARMING.

This was the first query discussed. Mr. Doolittle had not attempted making colonies queenless for any such purpose, and did not believe in it as far as his locality was concerned. He had taken queens from colonies, and such queens had worked vigorously storing honey, and when the queen was put back, the colony would work vigorously in carrying stored honey into the boxes, and in bringing in new honey from the field. The remarks of Mr. Doolittle seemed to be endorsed by Messrs. Elwood and Betsinger.

NEW INVENTIONS AND DISCOVERIES.[1]

Mr Locke presented a very ingeniously constructed instrument for measuring the length of a bee's tongue called the Bees' Tongue Register. He hoped to be able thus to discover the bees having the longest tongues and from these it would be best to rear future stock and thus obtain an improved race that would secure honey from the largest range of plants. The instrument was most heartily commended and endorsed by the convention.

Mr. King of New York presented a sample of a reversible frame and another sample of such reversible frame was shown by Capt. Hetherington. Mr. H. had tried the experiment of reversing frames to induce the bees to carry up honey from the bottom of the brood frames into the boxes but had not been as successful as a Michigan beekeeper.

Mr. Todd of Philadelphia presented an instrument showing that liquid spheres of equal size pressing

[1] Owing to lack of brevier type, we were compelled to use a different letter for the remainder of Convention Notes.

against each other with equal pressure would produce hexagonal figures of mathematical accuracy, the angles of which will be identical with those in the honey comb: the instrument was examined with great interest as it seems to show that the bees in the manufacture of comb only follow a great law of nature.

Mr. Clark presented the report of the committee on the constitution and by-laws.

The only important objection that was made to the revision was found in Art. 1 of the constitution which read as follows: viz.: This association shall hereafter be known in remembrance of its founder as the Quinby Beekeepers' Association and shall include in its jurisdiction the entire State of New York.

The discussion upon this article was a long and tedious one, Messrs. Dickinson, Betsinger and others objecting to naming the association after a man deeming it better to make it simply the New York State Association.

Messrs. Hetherington, Elwood, Clark, King, Locke and others, many of whom had been members from its organization deemed it only just and right that the one who had founded the association and had sacrificed so much for apiculture should be entitled to this small token of respect and honor from those who have been reaping the benefit of his labors.

The opposition succeeded in showing a majority and the constitution and by-laws were adopted as follows:

Art. 1. This association shall be known as the New York State Beekeepers' association founded by Moses Quinby in 1868.

Art. 2. Each county or district convention hereafter held in any part of this state shall be entitled to three delegates to the State Society.

Art. 3. (Same as in old constitution.)

Art. 4. The officers of this association shall consist of a President, Vice President, Secretary and Treasurer, who shall constitute the executive committee and whose duties shall be those usually assigned to such officers and their term of office shall be one year or until their successors shall be elected.

An honorary Vice President shall also be appointed from each county of this State.[1]

The by-laws were unchanged with the exception of the following:

Art. 5. The secretary shall receive ten dollars each year for his services and he shall have power to choose an assistant secretary if he wishes.

Art. 6. The regular meetings shall be held alternately at Rochester, Albany Utica and Syracuse, but shall be held no two years in succession at the same place.

FRIDAY MORNING SESSION.

The chair stated that an error had been inadvertently made on Thursday evening in the adoption of the first article of the revised constitution.

By the provisions of the constitution, a two-thirds vote is required for its amendment. The revised article had received a vote of twenty-four in favor and twenty-one in the negative. He (the chair) had declared the article thus revised, when it really lacked six votes of the necessary two-thirds. The chair wished to correct his ruling and declare the vote in favor of the said article lost.

Mr. Clark, of Oneida, moved that the first article of the constitution be revised to read as follows, in accord-

[1] As the list of the vice presidents representing the different counties was found unreliable and incomplete, we have omitted it, but will publish the same as soon as we can secure it.

ance with the wishes of the majority as expressed Thursday evening.

Art. 1. This association shall be known as the New York State Bee keepers' Association (founded by Moses Quinby in 1868). Carried.

BEST MANAGEMENT OF THE APIARY FOR COMB HONEY.

Secretary Benedict then read a paper on the above topic.

Mr. President,

Ladies and Gentlemen

and Fellow Beekeepers:

The question that has been assigned me, if I shall speak upon it, in the full meaning of the topic as it is given in our programme, I shall have to assume myself as having a better method than any that has been given, by any of our honored leaders in *Bee Culture*. And when I think of such men as the lamented Quinby, Rev. L. L. Langstroth, Capt. Hetherington, Elwood, Doolittle, Heddon, Betsinger and many others, it little becomes me to assume that I can give to this honorable body of beekeepers "The Best Management of the Apiary for Comb Honey!" I hardly think when the committee gave me the question, they took into consideration the varied climate and the different sources from which we procure our surplus honey; that the management in one section of the country would not bring like results in another of a different surplus source.

So I shall confine what I have to offer, to a section in a latitude where clover and basswood are the principal sources of surplus.

We shall have to start in early spring, perhaps, before the first natural pollen is gathered, when we are letting our bees work upon rye or Graham flour, as this should be given to supply until natural pollen comes. Now, when natural pollen appears, or better before, on some warm, pleasant day, look over each colony and see that they have a good queen and plenty of honey. And cover them with enamel cloth or some material that will keep in the heat and moisture. In about ten days look them over again, and you will find colonies that cannot cover eight frames, or the full number, to good advantage. Contract these by using the division board until they have no more frames than they can cover well. Be sure each time to leave plenty of honey, uncapping a portion that the bees may move it about in the combs; this will have a stimulating effect and cause the bees to lay more rapidly. Some may ask, why contract the brood chamber? For the reason that one of the great requirements of prolific brood-rearing is heat, and if your store is not large enough to warm your room, then contract your room to the size of your store.

Now let them rest about ten days more, and by this time the young bees in the hive will begin to be quite numerous, and if you find the queen is using all the room, add one frame to the brood nest. But this time make haste slowly, as you are liable to sudden changes, and you have many old bees that have nearly done their work, whose places will soon be filled by young bees. Now begin to feed and stimulate to brood-rearing as you have a good quantity of young bees to care for the larvæ and general work of the hive. This feeding may be done in the hive from a top feeder, or from a feeder placed at the entrance, or any way that you can easiest feed them a little every day; three or four tablespoonfuls is plenty unless they are very short of stores.

At this season of the year they use a large quantity of water in preparing the food for the brood, and if you will supply it by feeding one part of sugar or honey to three of

water, it will save thousands of workers that would go out unfavorable days in search of water and never return. You are now not far from the first of May. Push them as fast as possible as you only have about fifty days to white clover bloom. No one need have any fear of getting their colonies too populous at this time, and in this latitude with our short springtime. During the fifty days to come, look to each colony weekly, add combs by spreading brood and placing empty comb in the centre, keeping a record of every colony. Up to this, I have not said anything about hives. Good results may be obtained with nearly all of the movable frame hives. I think when we get to the honey season, a rightly arranged top-storing hive is preferable. But during spring management a hive, in which you can extend the brood nest, is of great advantage. A strong colony will use more than eight frames and be crowded, before the honey harvest begins. Now, if your hive is such that you can add extra frames, they will be quickly filling them with brood. Some would say draw a frame of brood and give to a weaker colony, and replace with an empty frame. This may be done, but experience has taught that, as a rule, better results can be obtained by letting the brood remain in the strong colonies until about the time you wish to put on your surplus storage. Then draw your extra frames, taking your oldest brood and give to your lighter colonies, if any still remain. By this time, they are ready to take care of it, and it comes when it will do them much more good than it would earlier. If you are fortunate enough to have your colonies on full frames, these extra combs with a few bees will make you some fine early nuclei, that will build themselves into good colonies if given a young queen or a queen cell. It is better to have a few young queens to give them, as you will want them when the swarming season comes.

Now we come to the honey season. We are all ready with sections filled with light foundation, not less than ten square feet to the pound, placed on racks with separators clamped between. Go to the yard, and as you pass through, and lift up the quilts and find that they are whitening the tops of the combs, we know that they are storing new honey and should be given the sections at once. I think I am safe when I say there is no way in which the sections can be given, that has the advantage of the rack, or clamping case, worked upon the tiering-up system. When nicely started raise them up and place another set under. Continue this until well in basswood time, then be careful not to get more started than the bees will finish on white honey.

Some of course are prepared to take issue with me, who are joined to their idol, the old wide frame, which, if for no other reason than the saving of time, should have been laid aside long since, and any hive that will not admit of taking the top off to a level with the tops of the brood combs, be placed with them and be kept as relics.

Now our dish is ready to catch the shower of honey. But just here comes the cry the bees are swarming just as they had one set of sections about ready to raise. What shall we do? I would say, with all strong swarms that issue up to within one week of the opening of basswood bloom, remove the old hive to a new stand. Place the new hive upon the old stand, filled with one empty comb, and seven frames of wired foundation, with the set of partly filled sections from the old hive placed in position on the new one. Now hive your swarm, and they are ready for business. You have all the working force of the old hive. You will seldom have any trouble with the new

hive swarming again. But now what is the condition of the old one? You will find eight frames of brood in all stages and young bees enough to care for the eggs and larvæ, and hundreds more hatching every day. Let them stand six or seven days; then open the hive and cut all queen cells saving the best to be placed in the nuclei from which you are to take a laying queen and place in the old hive and you have a swarm that will often fill one and two sets of sections during the basswood flow. After much experimenting, I find this allows the bees a chance to be true to nature, and still we practically control the swarming. Now we are within a few days of the basswood bloom and we must make everything count. Hive the swarm on the old stand as before, but do not carry the old hive to a new stand but place it beside the new swarm with entrance at right angles. Let this stand eight days. Towards night of the eighth day, open the old hive and you will find that you have a fair swarm of bees. Have your comb box ready, remove the combs, shake the bees at the entrance of the new hive, place the combs in the box, shake some of the bees from the old hive and remove to a new stand, and place the combs in the hive, cutting out all queen cells but one, or all if you have a young queen that you can give them. Now the young bees and what are yet to hatch will take care of the work in the hive, and with care will be in trim to take the last of basswood and store dark honey enough to winter upon. From the first swarms you will get more honey than you would had you tried to keep them in one hive by hiving, and returning to the old hive, and trying to suppress the swarming impulse. Second you get the greater part of the worker bees when they will do the most good during the honey flow. And with the above management you have doubled the number of colonies that have cast a swarm. Now, brother beekeepers, what I have said comes from practical experience, and if any one has gained a new thought then I have accomplished what I hoped I might.

Allow me to discard the subject as given, and ask you to accept this as one of the best managements of the apiary for comb honey.

Mr. King believed that the removing honey as fast as capped and to replace them with those that are but partially filled is the proper way to secure the largest amount of surplus honey.

This system did not discourage the bees but was in exact accordance with the nature of the little insect. Mr. Locke spoke in favor of the system and said it was that practised by the ancient Germans who kept at times a thousand colonies.

CIRCULARS AND PAMPHLETS.

The committee on circulars and pamphlets reported through Mr. Locke, and in motion the committee was continued another year.

THE REVERSIBLE FRAME.

The secretary read an article by Mr. Tefft on the "Reversible Frame." The article declared the invention a great improvement over the old hanging frame and it was very universally adopted by the most intelligent apiarists.

The article also referred to the objects to be gained by use of this style of frame.

Messrs. King, Betsinger, Root, Clark, Locke, Benedict, Doolittle and others, took part in the discussion, and it was generally admitted that at certain times in the season and with judicious management the reversible frame would prove a success.

Some of the objections offered were that if care were not taken, poor honey would be carried in the surplus boxes, thus injuring the quality of the

honey stored there, and that inexperienced beekeepers would, unless careful, reverse the frames too late in the fall.

Some changes were made in the committees when the question and answer box was opened and answers made to the conundrums therein contained.

On motion of Mr. Clark the executive committee was given power to name delegates and issue credentials to those wishing to attend the International Convention at New Orleans. On motion of the several gentlemen, all persons wishing to attend the North American Beekeepers' convention at Detroit next fall will receive credentials from the executive committee.

On motion of Mr. Clark any person inside the State may become a member of the association by signing the constitution and paying 50 cts.

Any clause in the constitution which conflicts with this was rescinded.

FRIDAY AFTERNOON SESSION.

After the convention was opened, Mr. Doolittle, on behalf of the committee, composed of Messrs. Doolittle, Todd and Locke, offered the following resolutions:

COMMITTEE ON RESOLUTIONS.

Resolved, That a vote of thanks be hereby tendered to all the essay writers.

Resolved, That the thanks of this association are due and are hereby tendered the representatives of the "Journal," "Evening Herald," "Morning Standard" and the "Courier," for their extended notices of this convention, the publication of our proceedings and other courtesies shown us.

Resolved, That the association do hereby tender a vote of thanks to our worthy President, Mr. L. C. Root, for the dignified and able manner in which he has presided over our meetings.

Resolved, That a vote of thanks are hereby tendered the mayor and common council of the city of Syracuse for the use of the City Hall.

Resolved, That this association are pleased to note the presence of a number of ladies during the sessions, and trust that they will, at our next convention, favor us with their presence.

Resolved, That this convention extend a vote of thanks to Mr. Arthur Todd, Philadelphia, for the interesting microscopic and scientific experiments given for the benefit of this convention.

Resolved, That a vote of thanks be extended to Silas M. Locke, Salem, Mass., for the scientific registration of the length of bees' tongues as connected with scientific queen-rearing.

Resolved, That a vote of thanks be extended to our retiring secretary for the efficient manner in which he has performed the arduous duties devolving upon him.

Resolved, That we as a convention do urge upon our members to attend the meeting of the North American B. A. at Detroit next fall and that all members so attending shall hereby be vested with the attributes of delegates.

All of which is respectfully submitted.

C. G. DICKINSON,
ARTHUR TODD,
G. M. DOOLITTLE,
SILAS M. LOCKE.

The report of the committee on questions was made by Mr. King as follows:

1. What is the best food for winter? ANS. Granulated sugar.

2. How many colonies of bees can be kept in one apiary. ANS. That depends on forage—from 20 to 2000.

3. Which is better for beginners, natural or artificial swarming? ANS. Natural.

4. How shall we prevent honey from candying? ANS. Keep it at a temperature of not less than 75 degrees.

5. When the bees hang out is it best to put on more boxes? ANS. Only when honey is plentiful outside.

6. How to prevent swarming when producing box honey? ANS. Keep the bees at work.

7. Why are porous cloth covers for winter use any better than enamel cloth? ANS. Because they permit the escape of moisture.

8. Why not use fine wire-cloth strung across the section frame instead of tin or wooden separators? ANS. Wire is too flexible.

9. Does pollen cause the bee diarrhœa? ANS. Yes and no.

10. What material is best to gum labels for glass or tin? ANS. Dextrine and hot water.

11. Is dividing preferable to natural swarming? ANS. Yes, decidedly.

12. Why is chaff packing better than dead air space? ANS. Because it is warmer.

13. Why are deep frames better for use in securing comb honey than shallow ones? ANS. Because they are better adapted to the collateral system.

14. Why are shallow frames better for use in securing comb honey than deep ones? ANS. Because brood will be necessarily closer to the sections.

The following resolution was read by Mr. Locke and adopted.

This Association having heard with great sorrow of the death, during the past month, of Mr. W. W. Cary of Coleraine, Mass., desires by this minute to put on record its high appreciation of his services.

A progressive beekeeper of one half a century's experience, among the very first to import and breed the Italian bee, and zealous for its purity—enthusiastic in every advance in the direction, both of the economy and manipulation of the honey bee, he took a high rank among those who have helped both by practice and pen to elevate and perpetuate the science of apiculture.

With these considerations we do resolve that as a mark of our appreciation of his services this minute be entered upon the records of the association and a copy sent by the secretary to the family of Mr. Cary.

Resolved, That we extend our sympathies to the afflicted family, and commend them in their grief to the God of all consolation and the very "present help in trouble."

The report of the committee on implements on exhibition was read, viz.:

REPORT OF COMMITTEE ON EXHIBITS.

Chaff Hive, top and side surplus storing, standing frame, Quinby. Exhibited by W. E. Clark, Oriskany, N. Y. Awarded first prize.

Chaff Hive, top and side surplus storing, hanging L. frame. Exhibited by King and Aspinwall, New York city. Awarded second prize.

Automatic Honey Extractor. Exhibited by G. W. Stanley and Bro., Wyoming, N. Y.

For extracting both sides of the combs, without handling the frames after being put in the basket, reversing the combs by revolving the baskets in an opposite direction, thereby saving one-half the time used by the old method. Awarded first prize.

Comb Foundation Mill. Exhibited by J. Vandervort, Lacyville, Pa.

For making thin comb foundation for surplus boxes. Awarded first prize.

Quinby Bellows Smoker. Exhibited by W. E. Clark, Oriskany, N. Y. Awarded first prize.

Bellows Smoker. Exhibited by King & Aspinwall, N. Y. city. Awarded second prize.

Inside Feeder. Exhibited by King & Aspinwall, N. Y. city. Awarded first prize.

HONORABLE MENTION.

Drone and Queen Catcher. Exhibited by James F. Norton, Winsted, Conn.

Honey Knife. Exhibited by W. E. Clark, Oriskany, N. Y.

One-piece Honey Boxes. Exhibited by Berlin Fruit Box Co., Berlin Heights, O.

Dovetailed Sections. Exhibited by H. D. Davis, Bradford, Vt.

Very nice nailed Sections and wood separators. Exhibited by J. C. Newman & Son, Peoria, Wyoming Co., N. Y.

Very nice nailed Spruce Sections. Exhibited by W. E. Clark, Oriskany, N. Y.

Bee Veil. Exhibited by W. E. Clark, Oriskany, N. Y.

Quinby's New Beekeeping Book. Exhibited by L. C. Root, Mohawk, N. Y.

Very fine sample of Extracted Honey. Exhibited by W. E. Clark, Oriskany, N. Y.

Sample of Ext. Cuban Honey. Exhibited by King & Aspinwall, N. Y. city, in color the best on Exhibition.

Three bottles of Ext. Honey. Exhibited by L. C. Root, Mohawk, N. Y.

"Bees' tongue Register." Exhibited by Silas M. Locke, Salem, Mass.

EXHIBITED BY ARTHUR TODD, PHILADELPHIA, PA.

Microscopical Exhibit of "Bacillus alvei" or Foul Brood, and "Spermatozoa" of Hive Bee, mounted by Frank Cheshire of London, England.

The "Holman" apparatus for demonstrating the tendency of Liquid or plastic Spheres to assume hexagonal forms under pressure.

The "Cheshire" Charts for use of Lecturers on Bees and Beekeeping.

Extracted Honey from W. S. Hart, Florida.

Extracted Honey from W. S. Dadant & Son, Hamilton, Ill.

All of which your committee would respectfully submit.

I. L. SCHOFIELD.
IRA BARBER.
G. H. KNICKERBOCKER.

On motion of Mr. Todd, local associations were recommended to purchase the Cheshire chart for beginners. On motion the convention adjourned *sine die*.

QUESTIONS AND ANSWERS.

Owing to the recent rush of business and the important changes that we have made, we have been obliged to omit the securing of answers for this department this month. We trust, however, that our readers will send us in lists of practical questions to be answered, as by so doing they can secure the opinions of a number of our most prominent apiarists. This feature is invaluable to those who wish to make a success of apiculture.

QUESTIONS BY J. H. WIRDMAN.

ANSWERS BY THE EDITOR.

1. Do you think it advisable to set the bottom of a hive directly on the ground, or is it better to set it on a stand or blocks, leaving an air space below the hive: and if so, how much space should be left?

And in leaving the air space, do you think that it should be enclosed up to the bottom of the hive?

Ans. Hives should always be so located and placed that the bottom boards will not gather dampness, but should not be raised so high from the ground, that during cold days, when the wind is chilly, the bees returning from the field will be blown under the hive upon the cold damp ground from which they can seldom arise owing to their being heavily laden and tired out.

It is best if possible to have the spot where the hives set raised a little in the shape of a mound above the surrounding grounds, and then the hives should be set on rough stands (hemlock is good) raised about 4 inches from the ground leaving a free opening under the hive. A slanting board on which the bees may alight should be placed in front of the hives.

2. What distance should hives set apart when set either hexagonally or in straight rows?

Ans. While bees will do well when the hives set about two feet apart in straight rows, with the rows from four to six feet apart, yet we prefer setting them hexagonally, and six feet from centres.

3. In what direction should the entrance of a hive face? Should all the hives in an apiary face in one direction? If facing in different directions, should any face the north?

Ans. If possible the hives should face the southeast, although they could face the south, and perhaps the south, southwest. This again depends somewhat on the protection from winds. One should so place and face his hives that when the bees arrive at the entrance, they will be protected from the cold winds; those from the west, north and northeast, being the most destructive. Also during Spring time and mornings, the bees need the warm sunshine that comes from the south and southeast.

4. What is your opinion of wire in frames?

Ans. If the wire is so well embedded in the wax that it is entirely covered, and full sheets of foundation are used and well fastened on the top and bottom to the frames, it is valuable, especially for use in hives in which new swarms are to be placed; but if the wires are exposed or left protruding at the bottom of the foundation, the bees will sometimes gnaw out. For general use, however, we have found the foundation without wire more handy and equally good; but care must also be taken in using the latter.

5. What is your opinion of metal rabbets in hives, and of metal supporting arms on frames?

Ans. We have never found any metal supports for top bars equal to the common wood top bars of the frame.

6. What do you consider to be the best material with which to cover the frames, at all seasons of the year?

Ans. Light duck.

LETTER BOX.

Clinton, Mich., April 12, 1885.

FRIEND LOCKE:

The American Apiculturist, Vols. 1 and 2 bound together, duly received. I must say it is a work of art. Your binder fully understands his business. It is a pleasure and comfort when you open it at any place to have it stay so without holding. I have just had six volumes of "Gleanings" bound in Toledo by a first-class binder, but they do not compare with the work on the American Apiculturist.

This work should be in the hands of and read by every beekeeper, being full of practical ideas. No one can read it but to be benefited thereby.

May you ever succeed in your noble undertaking is the wish of your friend,

H. D. CUTTING.

The American Apiculturist.

A Journal devoted to Scientific and Practical Beekeeping.

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BEEKEEPING AS A PURSUIT.[1]

BY ARTHUR TODD.

THIS subject may be regarded from two standpoints—that of the man who, with income assured from other sources, pursues beekeeping for its pleasure; and that of the man who, wishing to increase his slender income, or actually make an income, turns to beekeeping with a view to profit on the capital and labor to be invested. But, as to the latter are denied none of the pleasures enjoyed by the former, it is from the latter standpoint alone that I shall review the subject.

Beekeeping is, strictly speaking, a branch of agriculture, and many a farmer is to-day getting a greater return from his investment in bees than that received from any of his other stock; but right here I say that beekeeping as a pursuit has to-day become a "specialty." The man who enters upon this pursuit (leaving the question of capital aside) must be one endowed with physical and mental ability; a man with open eyes and ears, one ready for emergencies, prompt to do what is necessary at once, and one who is not easily discouraged.

The physical ability is required because beekeeping demands real hard work—yes, back-aching work—not suitable to the sick ladies and gentlemen so often ill-advised to go into beekeeping. The mental ability is required to keep the beekeeper abreast of the times and its rapidly changing conditions. Beekeeping is now a science, a study, and the conditions which govern one season, or colony of bees, will be completely changed for the next. Every stage in the life of a colony of bees requires to be understood. There must be no "guessing," and this will bring us to the cultivation of the habit of

[1] Read at the Beekeepers' Congress, at New Orleans.

observation, and a disposition to hear all that one can upon the special subject.

Emergencies will occur needing heroic treatment, but the beekeeper with mind and hand trained by experience and thoughtful consideration of his "specialty," will rise superior to any occasion, and when discouragement comes, as it inevitably will, in the words of the immortal Longfellow, "He will look not mournfully into the past, it comes not back again, but wisely improve the future for it is his."

Pleasure and profit go hand in hand, as a rule, in this specialty, although the former is not unalloyed by a liberal application of the "business end" of the little busy bee, and the latter by a recurrence of poor honey seasons. In nature are found both the beautiful and the sublime; in the hive both are constantly under the beekeeper's eye, teaching him to look with amazement from "nature up to nature's God." As he views his hive and sees the city grow, and population increase, the waxen walls, and stores well filled, the free-born citizen hurrying to and fro, each with his special task, outside of the thoughts of profit will come to the most unimpressionable, thoughts of wonder and admiration for the works of that great Architect of the universe who said, "Let there be life and there was life."

The profits of beekeeping are what? To many a one they hold out the hopes of "the glorious privilege of being independent;" and to obtain these profits the specialist, gifted with the requisite mental and physical qualities, must be "the right man in the right place." He must have hives of the movable-frame order. Moses Quinby wrote thus, in 1858: "There is not the least doubt, in my mind, that whoever realizes the greatest profit from his bees will have to retain the movable combs in some form;" and who of us will gainsay this to-day? Out of the many styles of movable-comb hives now in existence, the beekeeper will select one best fitted for the business in which he means to engage, be it the production of comb or extracted honey, queen-rearing, bee-selling, or a combination of all.

The specialist who intends to rear bees for sale will do well to employ that hive which will take the size and style of frame most in use in the district in which he resides. Interchangeability of parts is a grand secret of success, and the beekeeper who can sell a colony of bees, or buy a colony well knowing that each and every frame is usable in his own or his neighbors' hives, has made a step in the right direction. The main points in a good hive are, "Simplicity of construction, combining plenty of bee-space with perfect ease of manipulation."

The race of bees will next engage the specialist's attention. Study and experience, and also the actual line of business engaged in, will best decide this point. The black, the Italian, the Syrian, the Cyprian, and the Carniolan, alike have their votaries. At present, for all pur-

poses of sale and honey-gathering, the Ligurian or Italian-Alp bee is the principal one in demand; but the very best race of bees will afford but little profit unless the queens are carefully looked after. As fast as signs of senility appear, these should be removed and their places supplied by younger and more vigorous queens. The apiarist for profit should not only rear queens, but know how, when and where to replace them. He should also know the requisites of a good queen, and how to judge of her progeny.

Pasture to the beekeeper is everything; if that be poor, his returns will be poor; hence he should carefully examine his location. Districts vary greatly in their flora, and by a careful study of this question before locating, disappointment will be avoided. The beekeeper should be a walking calendar of the flora of his neighborhood for miles around, then, as the honey comes pouring in, he can tell its source and label it accordingly. This knowledge will enable him to build up colonies, and follow the old advice, "Keep your colonies strong;" so that when the honey does come, there are bees to gather it in.

The management of bees kept for profit will vary according to the object of the beekeeper, whether it be the production of honey or the rearing of bees or queens. In running for honey alone, we have the swarming and the non-swarming methods. The experiences of good bee-men are so diversified that one is reminded of the old saying, "when doctors differ, the patient dies." The bee-man must strike out his own line of action suitable to his own special circumstances. In running for extracted honey, swarming is, to a great extent, controlled, for "Poverty maketh humble;" but I insist that the good bee-man will know the condition of each hive, and act accordingly.

The specialist is a man who reads, and although he may not get or use a single one of the many traps, or patent articles now offered, he should know all about them; for at any moment, what he has read about these things may give him an idea, the successful carrying out of which may help him over a difficulty. The capacity of the beekeeper to attend to a certain number of colonies, be it greater or less, will have a great influence on the profits of the pursuit. As a pursuit, beekeeping should not be entered into without careful thought and consideration as to the capital required, the location and the suitability of the employment to one's temperament. To-day, before embarking in the business, it is possible for the intending beekeeper to serve an actual and willing apprenticeship in the yards of well-known and successful bee-masters. I need dwell not upon the advantages of this plan for they are obvious.

To the enthusiast with but small experience, I would say, "Go slow!" Read the good bee-literature now so easy to be obtained,

and never be above learning from others. Visit beekeepers wherever you can enjoy the privilege, attend bee-conventions, and gradually a store of knowledge will be gathered upon which you will draw with profit later on.

Profitable beekeeping as a pursuit is, to my mind, the outcome of the union of two great factors—"talent" and "tact;" for "talent is power, tact is skill; talent is wealth, tact is ready money; talent knows what to do, tact knows how to do it; talent makes the world wonder that it gets on no faster, tact excites astonishment that it gets on so fast; talent may obtain a living, but tact will make one. Talent convinces, tact converts; talent is an honor to the profession, tact has the knack of slipping into good places, and keeping them; it seems to know everything without learning anything: it has no left hand, no deaf ear, no blind side, with a full knowledge of the Pythagorean doctrine, 'that a man ought rather to be silent, or say something better than silence.'"

I submit these remarks to my fellow beekeepers, being painfully conscious of many shortcomings from the high standard of excellence that man should attend to who in these days goes into "beekeeping as a pursuit."

Germantown, Pa.

HOWES' REVERSIBLE FRAME-SUPPORT.

By C. J. F. Howes.

To whom does the invention belong? From articles lately appearing in *Gleanings in Bee Culture*, and editorial comments thereon, I think there is a misapprehension of what the above invention consists, or what it really is, and whose property it is. The above-mentioned articles and editorials are, I feel, doing me an injustice, and have a tendency, virtually, to rob me of all the benefits, to say nothing of the "honors," of the discovery, which I had considered to be *my property*.

As to what constitutes my invention, I will quote from my article in the *A. B. Journal*, page 57, in reply to Mr. Heddon's claim to the invention of the frame illustrated in *Gleanings*, page 104.

"At the annual meeting of the Southeastern Michigan Beekeepers' Association, held at Adrian, Mich., Jan. 23, 1884, I exhibited samples of a device for reversing brood-frames, which device, or plan, suspended the frame by strips of wood, or metal, which strips were pivoted to the centre of the end-bars, and extended up to the top of the frame, there forming projecting arms to rest on the rabbets, and allowing the frame to revolve on these pivots.

In describing the device before the convention, I distinctly claimed as my invention, the plan of suspending the frame between side-strips pivoted to the end-bars, as described."

Previous to the illustration and

description of my device, all reversible-frames had fixtures at both *top* and *bottom;* see *Gleanings* for 1882, page 71, also 1883, page 65, Burgess' device; 1884, page 155, Baldridge's device; and 1884, page 332, Hetherington's device. These attachments were entirely different in principle from the "Howes' Supports." No one had ever suggested revolving the frames on "*centre pivots*," previous to the illustration, and description of my frame in Gleanings for 1884, page 156.

Soon after I began to manufacture and sell Howes' Reversible Frame and Supports,— as advertised in *Gleanings*, for 1884, page 285,—reversing devices began to appear from all quarters; both men and women joining in the scramble for the "honor," if not for the profits of the invention; each one suspending the frame by "*centre pivots*," as I had described them. Several used hoop-iron bent at a right angle to form projecting arm. (Prof. Cook at the Michigan convention claimed to have tried this plan, though a lady, I think, first described it in *Gleanings*).

Mr. Root has often, through *Gleanings*, acknowledged that these different devices are, practically the same thing as the "*Howes' Support;*" still he does not hesitate to manufacture, advertise and sell them, as if the invention was common property. (See editorial remarks in *Gleanings;* page 74, describing Mr. Nuzvinis' device; then Editorial in next number, page 104, on the same subject.)

I submit the question, in all seriousness. Does not this state of things *justify* anyone, in securing his rights to the labor of his brain, by a *patent*, as provided by law? If a better device, to secure the results aimed at, by reversing the brood-combs, shall be discovered, I shall be glad to adopt it, in my own apiary, and will, willingly, pay for the privilege. Until then, I request all to "please keep off my preserve."

Adrian, Mich., Feb. 7, 1885.

WHICH IS THE MOST PROFITABLE RACE OF BEES.

By D. F. Lashier.

Which is the most profitable race of bees regarding brooding, comb-building, honey-gathering disposition and wintering qualities?

I have no desire to injure anyone's business and wish merely to bring to notice a few facts which it seems to me to have been overlooked.

Perhaps a few notes founded upon years of experience would not be out of place, especially as my motives are entirely unselfish.

I commenced beekeeping in 1872 with one colony of gray bees in a box hive. I purchased this hive of a neighbor whose bees seemed to be very hardy and gentle. They are of uniform size and as large as any Italians that I ever have seen, even when the latter were reared in comb of their own building. I hive all my gray bees without any protection whatever and the same when looking

for queens, etc. With the Italians this would be perfect madness.[1]

Doubtless some will say "your gentle bees must suffer from being robbed." Not so, my friends, they are good protectors of their homes.

I have purchased queens from some of the best breeders in the States hoping to get the best in the market, and I never have, as yet, seen any that will hold their own with my gray bees.

In breeding, the Italians commence a trifle earlier in spring, but they dwindle so badly that when fruit trees bloom they are not as strong as the gray bees.

For honey-gathering from the white and red clover the Italians and gray bees are about equal, but when buckwheat is in bloom the grays beat the Italians by fifty per cent.

I have wintered both races indoors and out of doors. The grays seem to become dormant not caring to move about, while the Italians are uneasy, crawling out of their hives and wasting away.

My gray bees have steadily increased by natural swarming[2] from the one colony to 120, all in the same apiary; giving me, in an average season, a nice surplus of box honey, and in a very poor season holding their own without feeding or spring dwindling.

I think that had one-half the pains been taken to improve some of our native bees that have been devoted to rearing foreign races, beekeeping of to-day would be in a far better condition. It is the general result and the general summing up that decide which is the more profitable vocation.

Of late years I have wintered my bees in a frost-proof building, and have found it to be a great saving of honey. At some future time I will tell your readers, if they wish, how this building is constructed so as to carry bees safely through five months of as cold winter weather as ever existed in my section, together with my experience in fruit raising in connection with beekeeping and how I manage to save my natural swarms from absconding.

This having swarms decamp to parts unknown is all wrong. I have had more swarms come to me than I ever had desert, and the idea that bees injure fruit blossoms is altogether erroneous. Why! we were obliged to prop up our plum trees last season to prevent them from breaking down with the load of plums, and of cherries we had a most bountiful crop and this right in our apiary too.

I should be pleased to give your readers a paper on fruit and bees if it would be acceptable.[3]

Hooper, N. Y.

[1] If our friend will visit us we will show him colonies of Italians that can be examined without fear of stings, and this with neither smoke nor protection.—ED.

[2] When working for comb honey, I return all of my swarms so that I get no increase that season.—D. F. L.

[3] Doubtless our readers would be pleased to hear from friend Lashier again, and we trust that he will favor us with the article. —ED.

HOW TO FORM NUCLEI.

By Henry Alley.

Most beekeepers wish to rear a few queens and must have for such a purpose a few nucleus colonies.

The following plan for forming them is an easy and simple one. The nucleus hives should be constructed of light material and about one-third the width of the large hive, and the covers should be cleated to prevent splitting and warping. If the hives are painted they will last many years.

The nucleus colonies should consist of three combs and two quarts of bees. When ready to form them, place in one of the hives two combs containing honey and, in the centre, one containing brood, after which add the bees. Perhaps the better way would be to remove from a full colony a comb containing brood, together with the adhering bees, being careful of course not to take the queen with them. In such case there will be a sufficient number of bees on the comb to care for the brood; if not, a few more may be brushed from another comb into the hive.

After the combs and bees have been placed in the hive, confine the latter to the hives for thirty-six hours and release them early on the morning of the third day.

Do not remove the screen (with which they have been confined) from the entrance except just before dark or early in the morning; as, if released in the middle of the day, the bees would rush out and many would not return.

After having been confined in the hive for thirty-six hours, the bees will have constructed several queen cells and when released will return to the new location.

A matured queen cell may be given them at this time; or, when they have been queenless seventy-two hours, a virgin queen can be introduced safely.

Before releasing the bees the nuclei should be placed some distance from the stands from which the bees were taken. While the bees are confined in the hives they should be supplied with water. For such purpose I find the cone feeder very useful.

If the reader has studied the article in the May number in reference to the drone trap he is prepared to have his queens purely mated with any particular strain of drones in the apiary.

Wenham, Mass.

A GUIDE TO THE BEST METHODS OF BEE-KEEPING.

By J. L. Christ.

R. F. Holterman, Translator.

(Continued from p. 90, Vol. III.)

PERTAINING TO THE FINEST AND BEST COLONIES.

It is a principle in beekeeping if one desires to derive a benefit from his bees, to see that one keeps very populous colonies. The mere number of colonies has nothing to do with amount of value; but their strength, the number of inhabitants in a hive, is the measure of its worth.

One single populous colony is worth more and will store more honey than four weak ones. In fourteen days the one will bring in more honey than the four will in four weeks.

I place a strong colony at 40,000 working bees; of these 13,000 to 16,000 can daily fly out and bring in stores; the remainder stay at home to care for the brood, to build comb, and to perform such other duties as may be required of them.[1]

Of four weak colonies, however, each calculated at 12,000 workers, only 4,000 can fly out leaving 8,000 at home. These four colonies together not only cannot send to the fields as many workers as the one strong one, but they also labor under many disadvantages.

It may be good weather for eight days and the flow of honey abundant and the strong colony may in that time gather all its winter stores, but the weak ones can take only sufficient advantage to gather at most one-fourth of the required stores. If unfavorable weather should follow, and the flow of honey cease, the strong colony is supplied and the four weak ones are lost in the winter if they be not fed, which latter is associated with much expense, trouble and inconvenience and even then often fails, not to mention the facts that the weaker ones cannot depend upon themselves as well against robbers, moths, ants, etc.; and in winter they cannot maintain the proper warmth as well, are more liable to be frozen, and are less able to stand the changes in temperature.

They cannot rear brood as early as the strong one and there are many advantages the strong one has over the weaker, one of the most prominent of which is that the strong one displays more energy and is more industrious than the weaker.

[1] Nature has wisely ordered it that generally only one-third of the bees in a colony fly out to the fields, so that the colony would not perish even if all the absent bees were lost through some mishap.

IN THE ORDINARY STRAW SKEPS ONE CANNOT CARRY OUT ONE'S DESIRES COMPLETELY IN MANAGING BEES.

As important and well known as the fact now is of having the colonies strong, one cannot make them so if they are kept in the common, simple straw basket where one does nothing but destroy in a slovenly way, especially farmers. In the fall they take the heaviest and lightest colonies and in a sinful and thoughtless manner kill and smother its inhabitants thus doing themselves a deliberate injury, as if they permitted these useful creatures, these patterns of industry, to live, they would gain far more.

I once saw a beekeeper take a very heavy colony consisting of two colonies which in swarming clustered together, and smother them, because he thought that owing to the large number of bees the colony might not have enough winter stores. Yes! a clown of a fellow actually burned with straw his young swarms, because they came rather late. But I do not intend to occupy my time describing the wrong mode of keeping bees, as through the length and breadth of the land this has been so passionately spoken of and they will learn, only

as matters progress, to adopt a better mode of beekeeping.

THE MAGAZINESTOCK[2] ARE CONVENIENT, PARTICULARLY WITH THE WOODEN TOP BOXES WITH A GLASS SIDE.

If one wishes to build up populous colonies, one must commence by controlling swarming: namely, swarming often. To do this, one must provide roomy dwellings and those that can be enlarged gradually; without this the object would fail. If one should give the bees a large dwelling at once they would become discouraged and would not half fill the hive and there would be many other disadvantages.

The dwelling must also be arranged in such a manner that the bees can be handled with ease and without damage to the bees, or ever to have to destroy the latter to enjoy the product of their industry and control their surplus in honey and wax.

All this is required; but now as to the care of the "magazine."

As the bees conduct their domestic affairs within a limited space and they from time to time according to the demands of time, attentions, etc., are increased or diminished, one generally makes them of straw (at least I have seen no others) and lathes which are very useful, if not too large (as they generally are); nevertheless, these straw "storing cases" have several drawbacks which I have found by observation and manipulation. Thus, some years ago, I conceived the idea of making, as far as possible, those that were more complete and convenient; to that end I made wooden four-cornered hives of boards and put in the same at least one pane of glass which, although only costing but little, is of inestimable value.

I improved on these until I found the most useful and convenient to handle.

The samples that I have I not only had myself for several years, but I also made some for good friends, and others made copies of them and their great value makes me recommend them unhesitatingly. These hives are very little more expensive than straw (if they are made plain and cheap), they last longer, are better and more convenient and can be made anywhere, while men who can make straw hives are often difficult to get.

One should not allow himself to be frightened into thinking they are too expensive, when conducting an extensive bee business; or that, if one begins with them, the profits will soon disappear.

I will just describe their completeness and their general utility and their advantages over the straw hive, more especially for the purpose of giving guidance how to make them of the greatest use in beekeeping.

Rodheim, Germany, July, 1783.

[*To be continued.*]

[2] Literally magazine or ware house hive.—R. F. H.

IS BEEKEEPING PROFITABLE.

By T. F. Arundell.

My attention being called to the article headed, "Is Beekeeping Profitable" (page 64, March No.), I will answer it to the best of my ability.

The answers to questions 1 and 2 depend simply on the annual yield of honey per colony, and the success attained in wintering. Should a surplus of 100 lbs or more be obtained from each colony (spring count), together with a moderate increase in bees and with little or no loss in wintering, success would be assured; but, should the average yearly surplus amount to no more than 40 or 50 lbs. coupled with severe losses in wintering, the business could not prove otherwise than a financial failure.

No. 3. In this section one man can properly manipulate at least 150 colonies and their increase, make the extra hives, and extract all the honey from them, excepting possibly, a very few days when honey is stored more rapidly than usual.

As to tools wearing out with use, I will say that I have extracted 40,000 lbs. (20 tons), in the last two summers with a four frame "Novice" geared extractor with no appreciable wear, and my honey knives are as good as when first bought. A well made hive should last a lifetime, so that the depreciation in value of utensils is more imaginary than real.

No. 4. Given a *properly arranged hive* and appropriate tools a man can extract from 120 to 140 lbs. per hour, say 1200 lbs. per day.

In four successive days last July I extracted and filled into cans 5,200 lbs. of honey, working about eight hours each day extracting and filling cans from the tanks mornings and evenings. Hives in my apiary average about 40 lbs. each extracting.

No. 5. In regard to the number of colonies an apiarist could oversee, it depends more on the talent and genius of the overseer than upon the number of colonies possessed. While one man can direct and control hundreds of employés, another cannot even manage his own labor to lead to the best results.

At some future time I would like to describe, in your Journal, the best and speediest methods of extracting honey in large apiaries as practised in this country.

Santa Paula, Cal.

INSTRUCTIONS TO BEGINNERS.

By the Editor.

There are, properly speaking, two systems of keeping bees: the one adapted to the needs of the expert and specialist who keeps a large number of colonies and devotes his entire time and attention to the pursuit; the other adapted to an apiarist who keeps bees in connection with some other business, either for the pleasure and recreation, or for the purpose of adding another source of income.

The latter class constitute the ma-

jority of the beekeeping fraternity and only too often are their needs overlooked by those who write upon the subject of apiculture.

While we are aware that if one is adapted to beekeeping, and enters into it properly in a favorable location and masters it that success will follow; yet, as a rule, we advise keeping bees in connection with some other vocation, as when one becomes thoroughly familiar with all the requirements of beekeeping it is an easy matter to enlarge his apiary. Then, again, a few colonies properly managed will generally give far better results than can be obtained from a large apiary.

Those who are just commencing should remember that the less they handle their bees, and yet accomplish what may be required, the better for their colonies.

If one is naturally nervous, it is best to wear a bee veil at first and when manipulating the colonies work gently and avoid jarring or fretting them.

When looking for the queen, blow a little smoke in at the entrance as this causes the queen to run up on the comb and the bees that may be running about on the bottom board will fill with honey.

One of the first steps for the beginner is to decide, as far as possible, to which class he intends to belong, and what amount of capital he can safely invest.

Where one has a limited capital and wishes to become an expert or a specialist, it is far better to begin on a small scale and gradually increase his number of colonies making them pay their way and also furnish funds for new investments.

If your first lessons have been gleaned from flaming advertisements or reports of enormous yields, or through reading some of the overdrawn works on apiculture (so written with the purpose of making new converts), just take some wholesome, practical food for study and thought, both by securing one or more of the works on practical apiculture mentioned in this journal, and by visiting some practical and successful apiarist. In this way, you will be prepared to look at both sides; and if, after doing this, you enter into beekeeping with a determination to succeed you are certain to make it pay, provided you are adapted to the business, and other things are equal.

There is not the slightest reason why nearly every person who has a fair-sized garden should not keep a few colonies of bees and thus provide the table with nature's purest and most healthful sweets. Success in any vocation always means hard work, together with push, tact, and energy. Thousands embark each year on the sea of business enterprise and the shoals and quicksands are strewn with stranded wrecks, yet there are those who, by rigid economy and shrewd management, accumulate a competency besides establishing a good remunerative business.

Our advice to those who wish to engage in beekeeping would as a rule be this. If at present you have no location, look about you and find a small place of from one to ten acres according to your means and the situation.

It is better to have the land slope to the south and east if possible and it should be well protected from the cold north and west winds. Perhaps you can rent or lease a place adapted to your needs. The surrounding country should be well supplied with bee pasturage in the shape of orchards, clover, basswood (if possible), wild flowers or many others that we might name but which are described in most of the works on apiculture.

Where one is located in the city or village and means to keep only a few colonies this advice is unnecessary, but with all others it is imperative that they locate in a good honey-producing district.

It is also best to learn if there are many bees kept where you wish to locate; as, while there is no law to prevent your establishing an apiary by the side of your neighbor, yet the latter has rights which it is proper and just to respect. This again will not matter without you intend to build up a large apiary.

One may secure a large yield of honey and yet find a poor market for it; hence it is always best to take into consideration the advantages for establishing a good home market. It will pay far better than shipping to large markets and giving all your profits to commission men.

There are so many items of interest which should serve as an introduction to these papers that we hardly know where to stop and must be necessarily brief and even leave many of them until we write again. In purchasing bees it is best if you want but from one to five colonies to purchase them of some reliable dealer and always select a standard frame, and it will pay you well to look into the merits of the various frames before making your purchase.

While for some reasons we prefer a frame about 10×15, yet as the "Langstroth Standard" is now so largely in use and is no objection as regards wintering the bees, we deem it best to adopt it in our own apiaries.

Circumstances must in a great measure control these matters, but whatever style is adopted it should be adhered to, else much trouble and expense will result.

We deem the tenement hive the best for all purposes. True, the first cost is somewhat greater, but in the end it pays.

The hives should be constructed in as simple a manner as possible, and while if one wants but a few he can make them after obtaining his colony of bees and estimating the size of the brood chamber; yet it is much better if he wants five or more hives to purchase them in the flat.

While we prefer for working bees a cross between the Italian and Holylands (from Syria), yet as a rule we would recommend the Italian as the *best* for the average beekeeper. Experience will teach one which is the best race.

We shall endeavor to give illustrations of different styles of hives in our next paper but have been too busy to attend to it this month.

Our first advice is "Make haste slowly," but "stick to it" until you have either mastered the business or found that you were better adapted to some other vocation.

NEW OBSERVATIONS ON THE NATURAL HISTORY OF BEES.

By Francis Huber.

(Continued from p. 95, Vol III)

Solicitous to learn its origin, and conjecturing that it might be masculine matter, he began to watch the motions of every drone in the hive, on purpose to seize the moment when it should be received by the eggs.

He assures us, that he saw several drones insinuate the posterior part of the body into the cells for that purpose. After frequent repetition of the first he entered on a long series of other experiments.

There was something very specious in this explanation: the experiments on which it was founded seemed correct; and it afforded a satisfactory reason for the prodigious number of males in a hive. At the same time the author had neglected to obviate one strong objection: larvæ appear when there are no drones.

From the month of September until April, hives are generally destitute of males; yet, notwithstanding their absence, the queen then lays fertile eggs.

Thus the prolific matter cannot be required for their impregnation, unless we shall suppose that it is necessary at a certain time of the year, while at every other season it is useless.

To discover the truth amidst these facts, apparently so contradictory, I determined to repeat Mr. Debraw's experiments, and to observe more precaution than he himself had done. First, I sought for that matter which he supposes *the prolific* in cells containing eggs. Several were actually found with such an appearance, and during the first day of observation, neither my assistant nor myself doubted the reality of the discovery. But we afterwards found it an illusion arising from the reflection of the light for nothing like a fluid was visible except when the solar rays reached the bottom of the cells. This part is commonly covered by shining fragments of the cocoons of worms successively hatched, and the reflection of the light from these when much illuminated, produces an illusory effect. We proved it by the strictest examination for no vestiges of a fluid were perceptible when the cells were detached and cut asunder.

Though the first observation inspired us with some distrust of Mr. Debraw's discovery, we repeated his other experiments with the utmost care.

On the 6th of August, 1787, we immersed a hive, and with scrupulous attention examined all the bees while in the bath. We ascertained that there was no male, either large or small, and having examined every comb we found neither male nymph nor worm. When the bees were dry we replaced the whole, along with the queen in their habitation, and transported them into my cabinet. They were allowed full liberty; therefore they flew about and made their usual collections; but it being necessary that no male should enter the hive during the experiment, a glass tube was adapted to the entrance, of such dimensions that two bees only could pass at once; and we watched the tube attentively during the four or five days that the experiment continued. We should have instantly observed, and removed any male appearing, that the result of the experiment might be undisturbed, and I can positively affirm that not one was seen.

However, from the first day which was the 6th of August, the queen deposited fourteen eggs in the workers' cells; and all these were hatched on the tenth of the same month.

[*To be continued.*]

EDITORIAL.

Doubtless our friends will not take it amiss if we give but a brief editorial this month. Our new enterprise is receiving such hearty endorsement from every quarter that we must conclude that we have taken the right step after all. We only ask that the reader and our customers bear patiently with us for a while. The season has been so backward that we are in a rush but shall be amply able to meet all demands.

We have not utilized the question and answer department this month as the amount of work that we have been obliged to perform has been simply enormous, but we shall soon have that department in running order again.

We would urge upon our readers the importance of creating a home demand for honey this season in order that we may not have a glutted honey market with which to contend.

Work hard at the State conventions to have county associations formed; these are the educators that will prove the gateway to a home demand.

Prepare to make first-class exhibitions at county fairs next fall: it will pay. It may seem as though this advice was premature, but we have none too much time to prepare for these fairs.

Remember that if we ever have a permanent market for our honey the beekeepers must make it.

We wish our readers to come to us with their experiences, successes and failures and we shall endeavor to give them such instruction as will aid them in their work.

Do not fail to send for a few of our "Companions" and distribute them for us; it will be but little trouble and will aid us wonderfully in building up our subscription list.

We are preparing to give our readers a large number of illustrations and as our list increases we shall be able to add many new and interesting features to our Journal.

We have already sent out 5,000 "Companions" within the last two weeks, and the call is so great that we are printing 5,000 more.

EXPERIMENTAL BEE FARM NOTES.

On account of the many duties devolving upon us in establishing our bee farm we have not as yet been able to carry out any of the experiments that we mean to test for the benefit of our readers.

While for the purpose of experimenting we shall devote some colonies to the production of honey, both comb and extracted, yet this season's operations will be confined almost exclusively to queen-rearing.

We start with about one hundred colonies of the different races of bees. The season thus far (in this locality) has been unusually backward and trying, giving us but little warm, pleasant weather and but few days when the bees could gather honey freely.

Last winter most of our colonies were wintered in the beehouse and were removed to the summer stands, about the 28th of March, in fine condition and there seemed to be but little difference between their condition and that of those wintered on the summer stands. The first work of the season commenced

when the bees were removed from the beehouse. The hives were cleared (as much as possible without removing the combs) of dead bees; the honey boards with which the hives were covered during winter were removed and replaced with mats on the top of which chaff cushions were placed.

We kept our colonies well packed that they might be snug and warm even during the sudden changes in temperature and we make it a rule never to remove such packing until warm weather has "come to stay."

As soon as the bees could be handled safely the colonies were examined and all combs outside the cluster were removed. This is an excellent practice, as by reducing the capacity of the brood chamber to the size of the cluster we enable the bees to maintain sufficient heat to carry on brood-rearing much more rapidly than when they are surrounded by a cold vacant space.

At the time of setting out the bees, the entrances to the hives were all contracted to about one inch and it is wonderful to see what a help this is to the bees in keeping the hive warm.

In a few days after being removed from the bee-house the bees were busily engaged in carrying in the artificial pollen (wheat flour) which we provided for them placing it near by in the apiary.

Brood-rearing soon commenced and in about four weeks the colonies began to show marked signs of increase.

Soon we found it necessary to add empty combs wherein the queens might deposit eggs. While in the hands of the expert this is a safe and sure method of building up the colonies rapidly, yet it must be conducted with caution else during a warm spell the queens may utilize more combs than the bees can cluster and thus neglect the brood in the outside combs which in such case must perish. Never spread brood faster than it can be covered and well protected by the bees even during the cool nights. During the last few days in April the weather was favorable for honey gathering and a few pounds were stored by each colony from the soft maple bloom.

Our colonies have been so well protected that they were not troubled with spring dwindling and soon they became so strong in numbers as to be in fine condition for queen-rearing.

It is poor policy both for the breeder and for the honey producer to attempt to rear queens with any but the most populous colonies if they want first-class queens.

At this date we have between 300 and 400 queen cells in all stages of construction and quite a large number of queens ready for fertilization.

Our queen-rearing is conducted by the methods given in the *Beekeepers' Handy Book;* and, indeed, after having practised all the various methods, we would as soon think of going back to the old box-hive system of keeping bees as to practise the old unsatisfactory and uncertain methods of rearing queen bees.

It is a pleasure to examine the nice evenly built and conveniently spaced rows of cells found in the queen-rearing colonies now under Mr. Alley's supervision. It is indeed a most interesting sight and one that we would be pleased to share with our beekeeping friends to whom we extend a most cordial invitation to visit us. We shall endeavor to impart to all our visitors all the information possible regarding queen-rearing and the general management of the apiary as conducted at our "bee farm." At present we have four races of bees from which we are propagating queens, prominent among which are the orange-yellow Italians. We confidently assert that we never saw or possessed a more beautiful or hardy strain of pure Italian bees.

We shall run four separate apiaries situated about three miles apart in order to keep each race strictly pure.

We have set out one hundred "prickly comfrey" plants, purchased of Mr. Arthur Todd of Philadelphia, Pa., and shall refer to them again later in the season. We have also sown one and a half acres of Bokhara clover for the bees and it will pay our readers to utilize every waste spot (at least) with either or both of the above. Increase in pasturage means increase in surplus honey. It is now time to prepare for the coming honey harvest and indeed in many sections of the country the surplus boxes have been placed in the hives, or the honey extractor resorted to. When the colonies that are to be run for section honey become populous and begin to build white comb along the edges of the top bars, and perhaps between the combs, it is well to place one set of sections on the hives but they should have only the amount of sur plus room that they can utilize and other sections should be added as they are needed.

A piece of comb foundation one-half the size of the section, cut in the shape of a triangle and attached point downward, will be a wonderful help to the bees and prove a paying investment to the apiarist.

If some colonies seem strong but do not utilize the sections readily, just exchange their empty sections with partially filled sets (bees and all) from other colonies. This is a plan practised more than twenty-five years ago by Mr. Alley and Mr. John J. Gould, formerly of Wenham. Mr. G. was at one time one of the largest beekeepers in this State.

Mr. Pond, however, credits a beekeeper in Maine with being the originator of this most excellent plan for inducing the bees to enter the sections.

There is one disadvantage in connection with this practice that Mr. Pond and others fail to give.

It often happens that when a colony at work in the sections is disturbed, the queens will run up into the latter and in the removal may be lost. To prevent this make as little disturbance in the transferring as possible and smoke down, into the hive, all the bees that cluster on the tops of the frames.

The bees removed with the sections will not quarrel with their new neighbors.

There are many items that would prove interesting to our readers but we have already devoted more space than we intended to this department and must await another opportunity.

CORRESPONDENCE.

THE HONEY EXTRACTOR.

FRIEND LOCKE:

Your beautiful book, Vols. I and II of the "American Apiculturist," is before me and its contents noted. It seems to fill the bill, being replete with items of importance especially to the more advanced apiarist. While we cannot forget the labors of a Langstroth, a Quinby, and a few other dear names, your work fills a more modern want, and if you keep in view the interest of honey producers, as I do not doubt you will, you ought to meet with success. I have been in the business of raising and marketing comb-honey about 35 years. Made a little at it once, but of late years it hardly pays. The injudicious use of the honey extractor has been a great damage to us as beekeepers, and it is the only thing I know of that can injure your success. This engine bee business is a mistake. Some are clamoring for a large iron extractor, that will extract not less than four combs in no

time. I suppose their reason for it is that the larvæ will not expire under the operation. Some do not relish larval honey anyway, and Joseph prefers quality to quantity, nor does he believe it benefits brood or comb to be violently whirled in the vortex of death.

They talk about a glutted market. Well! well! honey is down and the mourners go about the streets. What shall we do? Create a home demand? I think friend L. C. Root has answered this question on page 48, Vol. II, "American Apiculturist" when he says "we must devise some means of producing smaller crops," and I would add without diminishing our income that we annihilate the extractor. What other method can we rationally adopt to curtail the quantity and enhance the quality and thus keep up a demand at home and abroad? Self interest for one is self interest for all honey producers. It is better to make a little pay than a good deal not pay. I am not talking for the supply business; if I were, I should undoubtedly advocate the extractor, because what bees it does not kill in the larval state are hastened to an untimely death by a cruel and barbarous system, which creates a demand for fresh victims, fresh queens and fresh workers, so that now the supply dealer alone makes anything.

When a law is passed by the Legislature against the wicked practice of extracting honey as now carried on, it will be the happiest day that the bee, or the beekeeper who keeps bees for profit, has seen. Of course I do not hope to do justice to this question in so short an article, but would submit it to your thoughtful consideration as one of the most important questions touching the interest of the American beekeeper.

Be gentle with the little bee
Which toils the summer day,
To bring its treasures to your home
From every hidden way.

The fragile insect needs the care
And kindness of your heart,
If you would win his services
To aid you in a start.

J. C. CLARK.

Alden, N. Y., Apr. 15, 1885.

CHAFF HIVES AND DESTRUCTION OF BROOD.

MR. EDITOR:

I drop these few lines to you to ascertain whether the "Apiculturist" is opposed to publishing opinions of beekeepers in regard to certain hives, in certain localities, their good and bad qualities, etc.

I sent A. I. Root my opinion of the chaff hive, in my locality, how I lost my bees very nearly all one season, by using them; and I proved the cause to be the fault of the hive.[1] I must have been right, or he would certainly have published the article. At least I thought I was, since he didn't publish it, which is about two years ago. Now he ought not to have been opposed to publishing my article, because I have already read in the *Gleanings*, where he said he was always glad to have the children write pieces for it, because, as he says, they generally speak their mind right out, no matter whom it hits.

Now, I am no child, nor am I a professional writer; but I consider that my article was as well gotten up as any child could get one up, and it was just as plain spoken too, as any article a child ever wrote for *Gleanings*, but it must have hit in the wrong place.

Now, Mr. Editor, if the "American Apiculturist" is conducted and

[1] We are unable to decide to what extent the "Chaff Hive" was liable for the loss of our friend's bees, as quite frequently the lack of a thorough knowledge of beekeeping will result in loss of queens or bees which is attributed to the hive or dealer.

Our friend certainly has a right to speak and the columns of the "Apiculturist" are always open to those who wish to express opinions, so long as they do so in a fair, manly way. —ED.

run on such selfish motives, I would rather have my money returned than be considered a subscriber.

You are at liberty to publish this if you choose.

Sometime since I saw an article in one of the bee journals, in answer to an inquiry as to the reason why a certain gentleman's bees tore down their worker brood and dragged it out.

The answer that he received was this: in case the honey flow ceases suddenly, the bees will tear down their worker brood and rid themselves of it to prevent starvation which, so far as my experience goes, I have never found to be the case, although I have known the honey flow to cease very suddenly and very often with me.

When the honey flow suddenly ceases it is a very common thing to see the bees dragging out drone brood; but whenever I see any of my bees carrying out their worker brood I know that that colony is troubled with the moth (or wax) worm.

I then open the hive and assist the bees in ridding themselves of the pests, and I have never yet failed to find the latter travelling along just under the cappings of the brood, where their presence is easily detected by white streaks which are easily followed with the head of a large pin or the point of a knife and the worm removed without injuring the brood in the least.

I suppose that the bees, in their efforts to secure and remove the worms, tear out some of the worker brood.

J. C. SIMMONS.

Pottsville, Pa.

NEWS FROM NEW YORK.

FRIEND LOCKE:

Vols. I and II of the "Api" (bound in one) came to hand in nice shape. Its make-up is far superior to bound vols. of papers and magazines in general, being free from advertisements through the body of the book. In fact one could hardly tell that it was a magazine as it has a strong appearance of being compiled expressly for book form. The mechanical part of the work is ahead of any volume on apiculture we know of, and of course the literary part is *par excellence*, coming as it does from such men as L. C. Root, A. J. Cook, J. E. Pond, Arthur Todd, etc., etc.

No apiarist who wishes to be up with the times can afford to be without it. It is an ornament to any library.

The snow is all gone, but with the exception of a few days the weather has been cold and May 1 and 2 it froze quite hard in the night. The winter has been severe. The loss in bees in this county is fully 50 per cent, yet what are left are in fair condition.

Clover appears not to have been killed during the winter and I think we may look for a fair crop of honey if we can get our stocks strong enough to swarm in time.

Wishing you success, I remain yours truly,

C. M. GOODSPEED.

Thorn Hill, N. Y., May 4, 1885.

NEW YORK AND FLORIDA.

DEAR SIR:

Books, papers and "Apiculturist" received. Thanks.

Owing to the continued cold weather in January and February the orange bloom is not at its prime yet at this date (March 11), so I will omit the report of its value as a honey producer until next month.

The temperature for February was yet lower than for January. I have taken three observations daily for the two months.

For January, at 7 A.M., average for the month 55.° At 1 P. M., in sun and cloudy weather, highest 78°, at

8 P. M., 54.° Extreme temperature, hottest, 98,° coolest 34.°

For February, 7 A. M., 47,° 1 P. M. in sun, 79,° 8 P. M., 53.° Highest above 92,° lowest, 28.°

Greatest variation during seven hours, 58.°

February at 7 A. M., temperature only 7° colder; at 1 P. M. 1° hotter and at 8 P. M., 1° colder.

January was very foggy and damp and much more uniform in temperature than February.

Bees work every favorable day but no swarming in this vicinity this month.[1]

C. G. FERRIS.

Sanford, Fla., March 11, 1885.

EXCHANGES.

LIMITATION OF THE VISUAL FIELD OF THE WORKER HONEY-BEE'S OCELLI. BY THE REV. J. L. ZABRISKIE.[2]—The honey-bee is a remarkably hairy insect. On the head the hairs are dense, and of various lengths; and they cover every part, even the compound eyes and the mandibles. The antennæ, however, are apparently smooth, having only microscopic hairs; and a path through the long hairs, from each ocellus, or simple eye, directly outward,—to be described more fully presently, — is practically smooth.

The ocelli are so situated that when the bee is at rest and the face vertical, they are directly on the top of the head, arranged as an equilateral triangle, and one ocellus is directed to the front, one to the right side, and one to the left[3].

Long, branching hairs on the crown of the head stand thick like a miniature forest, so that an ocellus is scarcely discernible except from a particular point of view; and then the observer remarks an opening through the hairs — a cleared pathway, as it were, in such a forest —and notes that the ocellus, looking like a glittering globe half immersed in the substance of the head, lies at the inner end of the path. The opening connected with the front ocellus expands forward from it like a funnel, with an angle of about fifteen degrees. The side ocelli have paths more narrow, but opening more vertically; so that the two together command a field which, though hedged in anteriorly and posteriorly, embraces, in a plane transverse, of course, to the axis of the insect's body, an arc of nearly one hundred and eighty degrees.

These paths through the hairs appear to me to be indications that the ocelli are intended for distant vision, although the opinion that near vision is their function is held by eminent opticians.

The ocelli are nearly hemispherical, and the diameter of each is about fifteen times that of a facet of the compound eye. Such a form of lens would, I will concede, indicate for these organs a short focus, and hence, a fitness for near vision.

But if the ocelli are intended for near objects, it is difficult to understand why they are surrounded by a growth of hair so dense as to permit unobstructed vision only in a very narrow field, and why they are so placed on the top of the head as to be debarred from seeing any objects in the neighborhood of the mandibles and the proboscis, the ability to see which objects would appear to be very necessary in the constant and delicate labors of the worker honey-bee among the flowers.

Dr. Zabriskie exhibited the head

[1] By mistake this communication, which should have appeared in our last, was overlooked and as it contains valuable items we give it in this number.—ED.

[2] This paper was read at a meeting of the New York Microscopical Society, March 6, 1885.

[3] The ocelli are simple eyes or lenses, set between the compound eyes, as additional organs of vision. These organs are possessed by all insects which have compound eyes. —ED.

of the worker honey-bee for the purpose of illustrating the above remarks. At the conclusion of his observations, he added: "Besides the worker honey-bee, I have brought for exhibition the drone and the queen of the same species, and the queen-cells; the queen of *Bombus Virginicus*, one of our native humble-bees; the *Melissodes binotata*, male and female; the *Melissodes pruinosa*, both sexes; the beautiful *Anthophora dispar*, male and female of Tunis, Africa; and the celebrated little stingless bee of Abyssinia, the *Trigona Beccarii*, which lives in immense colonies, and stores large quantities of honey. The *Anthophora dispar* has a very long proboscis. The possession of such a proboscis by our own bees would add millions of dollars annually to the wealth of the United States.

CANADIAN DEPARTMENT.

R. F. HOLTERMAN, EDITOR.

We have to report a very heavy loss; at first one-third dead was supposed to cover the ground, but later reports will probably bring it nearer 50 per cent. The losses may briefly be accounted for, at least largely: by the failure of the honey crop after clover; consequent cessation of breeding and old bees ready for winter quarters; an unusual consumption of stores in the fall, followed by a severe winter. Men who stimulated breeding until a proper season, fed sufficient stores of the right kind and at the proper time, and properly packed their bees outside or had them in good cellars, were generally successful. Experienced beekeepers have generally been successful as they know and are careful about getting the proper conditions for successful wintering.

Martin Emyh, of Holbrook, wintered 178 out of 180; one winter he lost none out of 150 and his success is fully as great in summer management. He doubtless could give much information of value but we seldom hear of him in public.

Most parties report bees to have died in March after the severest weather had passed. Is this not additional proof that loss was caused by aged bees going into winter quarters and becoming worn out, and insufficiency of stores? One report before me gives eleven starved out of thirteen. Bees in some localities are doing remarkably well this spring. Fresh honey is being stored in abundance, combs having honey from top to bottom, and here we feel confident some of our colonies, unless there is a sudden change in the weather, will require extracting before the end of the week and the prospects are that beekeepers will reap an abundant harvest.

Brantford, Ont.

BOOK NOTICES AND REVIEWS.

—"Money in Potatoes" is the title of a valuable and instructive little manual published by the Franklin News Co. of Phila., Pa., which they kindly sent us for review.

—Mr. A. I. Root of Medina, Ohio, has also sent us a potato book entitled the A B C of Potato Culture, written by T. B. Terry of Hudson, Ohio, which is well illustrated and printed in good clear type.

Mr. Henry Alley, of Wenham, Mass., has submitted for review, the proof sheets of the latest edition of the "Beekeeper's Handy Book." Our reason for not waiting until the work was complete was because it will be placed on the market at about the same time that our subscribers receive their journal.

Mr. Alley's former work was an invaluable addition to bee literature, giving as it did, not only the most scientific, systematic and practical method of raising queen bees, but also many other items of interest and much valuable information, gleaned from an intimate acquaintance with beekeeping of about twenty-seven years. The present work, however, surpasses the former in every respect, and no beekeeper can afford to do without it.

The instructions given have been thoroughly tested by the author who has made a success of the business, and these instructions are presented to the reader in a simple matter-of-fact way: They are, in fact, the concise description of the every-day experiences, for nearly twenty-seven years, of a thoroughly practical apiarist who has mastered every branch of the business.

This work contains about 300 pages, and nearly one hundred illustrations.

While we have other valuable works on Apiculture, yet none of them fill the position occupied by the "Handy Book," and no matter what works one may have this one should be procured, as it will more than return its cost each season.

The first part contains about 175 pages, is devoted to general subjects of apiculture, while the second is devoted to queen-rearing.

The author, so to speak, takes the beginner out into his apiary and gives him just the information needed to enable one who is almost wholly unacquainted with the bees, to commence this study and continue it with a surety of success.

He tells the beginner "how to start an apiary," how and when to select, pack and remove their bees, when to place the section-boxes on, how to prevent bees from deserting surplus boxes on cool nights, and how to strengthen weak colonies.

His description of swarming and the proper care and management of swarms is excellent, while that pertaining to queenless colonies and their care is very important and valuable.

The subject of comb-foundation and its manufacture is complete and exhaustive, and is written by one of the best manufacturers of comb-foundation in the country.

The chapter on beehives, their construction, etc., is entirely a new departure, and original with this work. A large number of the best are illustrated and described, also their valuable features, as claimed by their originators.

The work also contains a brief, but interesting, description (with fine illustrations) of the various honey producing plants, and also the enemies of bees.

The second part, which is devoted to queen-rearing, has been revised and corrected, and many new and valuable illustrations and items of instruction have been added.

It is a work that we can heartily endorse and recommend as indispensable to every beekeeper.

NOTES AND QUERIES.

—Mr. J. M. Shuck who a short time since suffered a severe loss in the burning up of his beehive stock, has just sent us his neat and attractive circular stating that he is again prepared for business.

—We have just received from Mr. Pryal of Temescal, Cal., a complete file of the *California Apiculturist*, which we are pleased to add to our collection. Mr. Pryal will please accept our thanks for the same.

—We shall issue our Journal from June to December on the 15th of the month.

—Those who are so strictly orthodox in their opinions, especially when criticising others, should remember that their first duty is to practise what they preach, as their teachings will then be productive of good.

—We shall continue to issue our Journal from the Salem Press office, but all communications should be addressed to Wenham, Mass., and when sending money do not forget to make all postal notes or money orders payable on Salem, Mass., post office.

—We have just received a circular and price list from Mr. B——, who is now in Europe dealing in foreign queens and bees. The character of the language and criticisms contained therein will not warrant us in giving it a favorable notice. Manly criticism or counsel and advice, or one's opinion expressed in kindly language, always demands respect; but since Mr. B—— has engaged in the sale of the eastern bees and queens he has introduced some finely drawn lines of distinction between the names given to the different races of bees from the Holy Land.

Until lately we had no trouble in understanding what was meant by the terms Holy Land bees, Syrian bees or Palestine bees, and in order that we may be set at rights again will some one *capable of judging* kindly tell us what countries are included within the boundaries of the Holy Land (not Holy Land proper.)

Mr. B— is not even contented to establish names of his own but makes it a point to abuse all those who differ from him.

We trust that he may yet learn to allow others the same freedom in expressing their opinions that he wishes himself and then abstain from abusing them for so doing.

—We have just received from F. D. Wellcome of Poland, Maine, the finest lot of red raspberry plants that we ever saw, they certainly do him credit.

—As we are now publishing 5,000 copies per month of our Journal, advertisers will do well to give it a trial.

—Use every effort to work up a home demand for your honey this season as in most cases it will pay much better than sending it to city markets.

—Read all our club offers for this month carefully and if you should receive more than one copy of our Journal kindly hand the other to your neighbor. It may do him some good and it will help us.

Better chances were never offered to secure first-class goods cheap than will be found in our club list.

— Mr. J. C. Clark submits his communication to us for consideration, and we would state that while the extractor in the hands of an inexperienced apiarist or by injudicious use will doubtless prove a great injury, yet we consider it one of the most valuable implements in a well conducted apiary.

The trouble with the "glutted" honey market comes, not from the use of the honey extractor, or the over-production of honey, but from a lack of proper knowledge and means of creating a demand. As a rule we do not consider it best to extract honey from combs containing unsealed larvæ, but one must be governed by his knowledge of and experience in this business.

We could not be hired to do without the extractor for many reasons.

We should be pleased to hear from Mr. Dadant on this subject, as he uses the extractor extensively.

A few days since while we were busy at the desk, Mr. Alley called us out into the apiary to witness a swarm of bees issuing from a hive that was

provided with one of his drone traps. It was very amusing and interesting to watch the honey-laden bees rush pell-mell out through the perforated metal entrance giving conclusive evidence that the perforations were amply large to freely admit a worker bee laden either with pollen or honey.

Soon the queen unable to force her way through at the entrance passed into the trap. As soon as the majority of the bees had passed out we removed the drone trap, fastened it to the end of a long pole and rested it against a small tree near by. In a short time the bees, discovering their queen in the trap, clustered upon it.

When the bees had become quiet we removed the trap to a convenient shady spot near by and laying it on its side placed over it one of the swarming boxes, covering the box with a board so as to cover the wire cloth and make it dark within the box.

We then left the swarm in that condition for about six hours in order to experiment with it and learn whether the queen would force her way out.

In the early evening we examined the swarm and found that the queen was out among the bees in the swarming box, and found that as the trap was laid on its side the bees that filled the trap formed a bridge over which the queen could pass through the wire tube through which she passed into the trap.

This is a valuable feature of the trap because if one cannot always be at hand to attend to the swarms, the queen after about six hours will find her way back into the hive again, thus preventing either her loss or that of the bees.

We have had considerable experience with hiving swarms, but never performed the task with such ease or so speedily as we can with the drone trap. We can heartily endorse it as invaluable to the beekeeper even for this one purpose alone.

We shall experiment further with the trap and give the results.

—Mr. J. D. Goodrich of East Hardwick, Vermont, has sent us some most excellent comb foundation. The thin for sections was especially fine.

—For $3.00 cash we will send the "American Apiculturist" one year and one of our fertilizing hives containing four combs with brood and one-half pound of bees and a choice selected queen—the hive will also be supplied with one of our cone feeders. With this small nucleus colony one can rear a number of queens during the season and it will be a great help in learning queen-rearing.

—Advertisers will please notice the change in our rates, 15 cents per line each insertion. There are about seven words to the line, and twelve lines to the inch. In sending copy always write it on one side of a separate sheet of paper and be very particular to have the names, addresses, etc., very plain.

Parties unknown to us must send cash with the order.

All copy for advertisements and manuscript must reach us by the first of the month, if they are to appear in the following number which we shall issue on the 15th of the month until December.

LETTER BOX.

Des Moines, Ia.

DEAR SIR:

Am in receipt of Vols. 1 & 2 of the "American Apiculturist" handsomely bound in cloth with an enormous golden bee on the front cover. Happy bee! to thus repose upon a production that has sprung up under the skies of Quinby, Carey, Parsons, Elwood, Alley, Hetherington, Doolittle, L. C. Root, and a

host of northeastern beekeepers who have honored the calling.

The attractiveness of the book and its practical teaching should find for it a ready sale.

J. M. SHUCK.

Willamina, Yarnhill Co., Ore. April 22, 1885.

S. M. LOCKE, SIR:

I have just received your first and second volumes bound together in cloth, and must say that it exceeds my greatest expectations. Every beekeeper should have it.

FRANK S. HARDING,

Pres. of the Willamette Valley B. A.

Oxford, Butler Co., Ohio.

DEAR SIR:

Vols. 1 & 2 of the "Apiculturist" received, and after carefully examining its contents, I have no hesitancy in pronouncing it fully up to any bee journal published. Its contributors are first-class, and show by their articles that they are men of ability. I highly approve of your treatment and condemnation of fraud in every shape. I am pleased to meet with the familiar face of our old friend Mr. Langstroth in Vol. 2. He lives within 200 yards of me, and is one of the dearest old men I ever knew. A person has only to know him to appreciate his worth.

D. A. MCCORD.

Battle Ground, Ind., April 13, 1885.

DEAR SIR:

The "Am. Apiculturist" came safe to hand, and having examined its contents, or rather the headings of the major part of the book, I pronounce it *ne plus ultra*. It should be in the hands of every respectable beekeeper of our broad land, it being complete and full of most useful knowledge With many thanks I am, sir, very truly yours in fraternal bonds of apiculture.

P. S. I truly wish you success, in all that is good and honorable, and shall try to furnish an occasional article for the Am. Apiculturist. Please find this my second contribution to same. If acceptable you are at liberty to publish. Trusting the "Apiculturist" may live long and prosper, I am as ever,

J. M. HICKS.

Brantford, June 4, 1885.

FRIEND LOCKE:

I see by the last number of the "Apiculturist" much new and valuable information from England and Germany. Last fall I learned through a German journal that the poison of the honey bee was utilized in curing honey.

A thought suggested itself to me which I hoped ere now I should have been in a position to practically test, but circumstances have been unfavorable and perhaps you know of some one who would take an interest in the matter.

I intended taking a strong colony and feeding them, say 3 lbs. of syrup per day and allow the bees to seal this and extract with great care. Then feed the same colony 25 lbs. in a day of twenty-four hours (and it can be done) and after it has been sealed extract as before, during hot weather, and again later in the season, giving four distinct experiments, and then test the various syrups for difference, if any, of quantity of poison contained in stores. If a marked difference occurred after repeated experimenting the matter might be worthy of consideration and thus one reason why stores put in late are not as good as those given earlier.

I must say a man must be too much of an enthusiast if he considers, as many appear to, that any one condition, if fulfilled, will insure perfect success in wintering. Doubtless much is to be learned in wintering, and theories advanced will often be another step towards success. If we only acted thoroughly up to our present knowledge and were more careful, the percentage of loss would doubtless be wonderfully reduced.

Your brother beekeeper,

R. F. HOLTERMAN.

We are pleased with Mr Holterman's suggestions, and, if possible, will make some tests, as this matter is of more vital importance to beekeepers than they are aware. We shall refer to this again in the near future.

Mr. Holterman has touched the right key; we must have more careful experimenting with a view to solving some of the mysteries that now surround apiculture, and we trust that others of our readers and beekeeping friends will offer like suggestions and also assist us in making the tests. It will pay you well to do so, and we can by this means help each other very much.—ED.]

The American Apiculturist.

A Journal deboted to Scientific and Practical Beekeeping.

ENTERED AT THE POST-OFFICE, SALEM, AS SECOND-CLASS MATTER.

Published Monthly. S. M. LOCKE & Co., Publishers & Prop'rs.

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THE BEES OF INDIA.

BY A. BUNKER.

I HAVE been promising myself the pleasure of writing to you for some time, but the extreme heat and my duties have prevented till now.

I spent the month of April in the jungle studying bees. It was my vacation. I camped on the top of a high mountain amidst trees of great size, which afforded a dense shade. Although the thermometer often showed 86°, yet we found this place a great relief from the heat of the plains.

Here the bees are very numerous. The *Apis dorsata* is found in two varieties; the *A. Indica* in three; the *A. flora* in two; and what I suppose to be the "*Melipona*" of South America, in six or more varieties.

At first dawn the bees pour forth from their homes, and their mighty hum fills the air. Trees up to three and four feet in diameter, with wide spreading tops full of bloom, and others covered with great creepers, a foot in diameter, with a bloom so fragrant, that its sweetness reaches to a long distance about, tempt the bees to their feasts of honey.

One would suppose, that under the circumstances, the bees would gather great quantities of honey, but it is seldom the case, even with *A. Indica*, that any considerable quantity of honey is collected, owing in part, I suspect to their many enemies, which tend to break them up into many swarms, and these being small are easily destroyed, or caused to abscond from nest after nest. For instance, the moth is very destructive, and when once they attack a swarm, the victory is soon won by one side or the other, mainly on the side of the moth I think. I captured a fine large swarm of yellow *A. I.*, and on transferring them, found a few moth worms which I destroyed. In a few days the whole swarm absconded, and on examination I found the combs riddled by moths, that is, all that were not torn

down by the bees, in trying to rid themselves of their enemies. Again, the small openings in the trees compel the bees to swarm, even when the parent swarm is small. Their environment, as Mr. Spencer would say, is not favorable to large swarms, and the energies of the bees are devoted to increase of species. Honey can be got in small quantities all the year round so there is no necessity to store it up save for a rainy day, and there is seldom more than a week in the depth of the rains that bees cannot take a flight and gather some honey and pollen. There is one kind of *A. Indica* which I have not been able to capture yet, which takes up its abode in piles of rocks, and forms large storehouses of honey. This kind seems to be an exception to the general rule.

Notwithstanding all these difficulties which the *A. Indica* must meet, they multiply with great rapidity, and I hope may yet be made of some use under domestication. I have had six swarms, several months, under trial, and although I have obtained only ten pounds of honey, yet I am encouraged to continue experiments. If I can restrain the swarming impulse sufficiently to secure large swarms, I believe they can be made useful. I have taken one colony through the season without swarming, and now I have a very large hive of bees, which I am trying to induce to work in supers. They are now at work on combs placed in supers, but do not act as if it was natural to them.

These bees are remarkably gentle, I have taken as many as a dozen swarms from trees this year with scarcely a sting, though working often without a vail. But they have their moods, and before they are fully subdued one needs to be careful.

The *A. dorsata* has been under study as well as other races, but as I am not yet satisfied with my experiments, I dare not write much about this class or the "*Melipona*"(?). This last class is a stingless bee, producing abundance of wax, and little honey, but offering a very interesting study to the lover of natural history. I have two varieties of this class of bees in observatory hives, and I hope to have something interesting to report by and by.

Toungoo, Burmah.
May 18, 1885.

BUILDING UP.

By C. M. Goodspeed.

After such a winter as we have just experienced, the question comes in from all sides, "How can I best restock my empty combs?"

Making a practice, as I do, of selling bees and queens, I am doing this building up all the time and will tell you how I do it.

In early spring I confine each colony on just as many combs as they will cover thoroughly and no more, examine them carefully each week, and as soon as I am sure they will bear it I increase the brood room and insert one empty comb in the centre. Be careful not to do this until there are bees enough to keep all warm.

Mark the date on the top-bar of this frame. The object of this is to get a frame of brood that will hatch rapidly. I treat all that I wish to run for increase in just this manner, after they are strong enough to crowd four frames, always drawing all frames given, as described above. Just as they begin to hatch nicely, great care should be used so as not to get the queen but take all adhering bees. Two of these frames of brood and bees will make a good nucleus, but I use three or four if I have so many that hatch together.

In the morning of some warm day, take a nice clean hive and put as many of these frames in as you can afford, taking only one frame however from a hive. The novice may fear putting so many strange bees together lest he should induce them to quarrel, but there is no danger as every bee if she attempts to leave her own comb "bumps noses with a stranger" taking the fight all out of her. This mixing up also helps to keep the old bees from going back to their old home. Let them be in this condition one hour; by this time all the knowing ones have gone home and they will take anything you have a mind to give them for a queen. If it is a queen that has come a long distance, or a virgin queen, I carefully lift up one corner of the quilt without smoke, and let her run in on the combs; if a cell, rest it carefully in one corner between the top bars of a couple of frames. A laying queen from my own yard I let run in at the entrance. The old stocks are managed in this way until they have increased to the ull capacity of the queen. Then if I have occasion I draw from them more heavily. The young colonies are built up by adding brood without bees; or, better, exchanging one of their combs from which the brood has hatched for one about to hatch. But after they get a laying queen of their own I help them no more except by adding empty combs as they require until the two have reached a strength that will employ the full laying powers of their queen and then treat them just as the old ones; drawing brood, bees, etc., as they can spare it. If this plan is carried late into the season the nuclei should be formed by taking more frames to start with, "say eight," so they may be strong in bees at once. In following this plan one must be posted in the flora of his locality or else be willing to feed liberally if he starts nuclei after the honey flow has ceased.

Thorn Hill, Onon. Co., N. Y.

DOES BEEKEEPING PAY?

By G. W. Demaree.

For the benefit of those who may be in want of information as to whether they may safely take up the business of beekeeping, with reasonable expectation of fair compensation for outlay of capital and labor, I ask the privilege to reply to your correspondent whose article and list of questions appear on page 64, current vol. 'Api." In the first place "Apis Canadensis" fails to recognize the fact that bee culture, as a business

pursuit, is in its infancy, and therefore many "pranks" and "tumbles" may reasonably be expected of it at the start. The prattles of the "works on bees" about the profitableness of bee culture has done but little harm, in fact less harm than good in a general way.

Most of the works on bee culture, though enthusiastic in style, are conservative in fact, and have done an immense amount of good. It is true that one or two "works" that have been pushed into wide circulation are full of "advertisements" of expensive machinery, and cranky fixings not at all suitable to the humble occupation of beekeeping. The world would be better without these, but they are simply excrescences growing on the limbs of the infant giant, to be brushed off in more mature years.

These are "sweet advertisers" who take advantage of the enthused, to fleece them while in a muddled state of mind. Like Joab of old, they take their victim aside and say "brother" or "friend," and stab him — in the pocket? Of course. I know no remedy for these evils. People who enter the enthused state of mind incident to "bee fever" will have to abide the crucial test of the "survival of the fittest."

I have a tender place in my make up which responds when addressed as "brother," or "friend," but I am too old now to be hurt by it; but let the novice beware that these "honeyed words" do not smooth the way to his pockets.

"Apis Canadensis" dicidedly labors under a delusion as to the true character of bee culture as a business. Bee culture is a *rural* pursuit, and cannot with fairness be compared with the greater lucrative pursuits of the world which make men "rich," or crush them forever.

Let him compare bee culture with other rural pursuits, and its most ardent friends will not shrink from the comparison.

How many hundreds of people toil on poor little farms, or cultivate lands on the shares, or toil as day laborers, or work on the farm by the month, or by the year, or toil as a mechanic, sometimes with employment and sometimes not, all of them barely eking out a scant living from year to year!

Compare the "lot" of the apiarist who is his own "proprietor," moving as "boss" among his myriads of busy workers, who bring him an humble, perhaps, but pleasant, living, with the above careworn toilers, and choose ye which.

How many persons working poor farms make anything above a bare subsistence? How many clerks, at a salary of $1000 or $1200, have anything over after paying the expenses of extravagant city life?

It matters but little as to just how many colonies of bees one man may handle profitably; that depends altogether on previous preparation. I plead the cause of bee culture as a pursuit, because it has ameliorated the hard lots of many worthy people, and is destined to ameliorate the hard lives of thousands of others in the future.

Is this not enough to justify Langstroth, Quinby, Cook, Newman, Ballantine, Alley, etc., to wax enthusiastic

over their success in bringing pleasant and remunerating employment to thousands of their fellow beings?

If the business of beekeeping turns out to be more precarious as a pursuit than at first portrayed, by the writers on the subject, the facts cannot be long concealed. Those who invest their money and time in the business will be first to find it out. In conclusion I wish to say that the average beekeeper does not necessarily need as high salary as a "first-class clerk" does. His life need not be so expensive as that of the latter. Besides, "first-class" clerks are not numerous, and "places of fatness" for such are full and running over. The apicultural field is as wide as land and sunshine.

Christiansburg, Ky.

"BIENENZEITUNG" NOTES.

By J. M. Hicks.

M. Bottner in the *Bienenzeitung* states that he has learned from his experiments in endeavoring to prevent swarming, and in wintering his bees economically, the following results:

1. *In wintering bees it is needless to be so exceedingly anxious and careful*, if they are well supplied with stores, and their hives can shield them from the severity of the weather. Placing them in some wintering repository is a useless and superfluous labor, and is less conducive to their health and comfort, than when wintered out of doors. For twelve years past, I have wintered my bees alternately in a cool, dark, dry, and quiet cellar, and in the open air. When housed, many died, dysentery prevailed among them, and the stocks were weak in the spring. When left in the open air, on the other hand, none of these evils were experienced.

2. *Water dearth is a mere imaginary trouble*, for the colony had overhead no covering on which vapor or moisture could condense. The window recess is only four inches broad, and all the rest was covered with woollen blanketing, which certainly absorbed all moisture. During the last fourteen years, I have kept my bees in top-opening hives. In the first four years, I did not close the interstices between the slats forming the honey board, leaving open such of them as the bees had not closed; merely placing thereon a sheet of thick paper and a cushion filled with hay, and they wintered well. Then the idea occurred to me that it might be better to close all these interstices thoroughly. Adopting the notion, I plastered them shut with clay. But the bees did not winter any better than before. As this plastering in the bee house was so inconvenient, I omitted it during the last four years on the six colonies wintered there; and these not only passed the winter as well as any of the others, but came out last spring as true colossal colonies. I had merely, as in former years, placed a sheet of thick paper on the honey-board, laid an old coffee bag on that, and covered

this with a layer of about four inches of hay. *There was no trace of water dearth.* Only be careful that your bees are not restricted to old candied honey for winter food.

3. Bees will swarm when so disposed, in spite of all the preventions the beekeeper may please to use. Give them as much room as you please, and ventilation to reduce the temperature; yet go they will, if the swarming mania seizes them. This colony had the entire garden-house as room for expansion; and that it is a cool place I am very certain. Still, the swarm left. Only by removing combs of maturing broods and inserting empty combs, can swarming be prevented.

4. *That a colony may be well wintered on seven pounds of granulated sugar.* In the first year my colony had not one pound of honey in store. I gave it seven pounds of granulated sugar in solution, and it was in a splendid condition in the spring. Granulated sugar is preferable to sugar candy, first, because it is cheaper, and, secondly, because it it is more soluble. On the first day of October, I placed equal quantities of this sugar and of candy, side by side, in a small open box in my cellar. On the twentieth, the granulated sugar was completely liquefied, whereas the candy then merely showed signs of moistness. A saucer of dissolved granulated sugar, exposed in my sitting room, began to candy only after the lapse of nine weeks.

Moreover, I apportioned fifty pounds of granulated sugar among twelve stocks insufficiently supplied with stores, allotting to each, in proportion to its seeming deficiency, and estimating one pound of granulated sugar as equivalent to three pounds of honey, and all these passed the winter in excellent condition.

We find in the above report of this able German apiarist some valuable instructions, especially in the wintering of bees on pure granulated sugar, being by far the best substitute for pure honey, when they are found lacking in Nature's choicest and best of food. But when we are told that bees do better without a proper protection as some would have us believe, we truly become sceptical with over forty years of experience, finding as we do that a cellar of a proper temperature, and kept so as to be free from dampness and sudden changes, as well as from all jars and noise is by far more preferable than wintering on summer stands.

Battle Ground, Ind.

A RECORD OF QUEENS AND COLONIES.

By G. A. Deadman.

I presume different beekeepers have various plans for keeping a record of queens, colonies, etc. The one I am about to describe, and which I have adopted will, I think, answer the purpose for which it is intended.

You first procure a small book with as many pages as you expect to have colonies; if the pages are not numbered it makes no particular dif-

ference as you can do that yourself. You next go to your tinsmith and get him to cut you as many pieces of zinc or tin as you require, or one for each colony; these will only cost you for the time it takes to cut them, as they need only be large enough for the number to be painted on them, and can, therefore, be cut out of waste material. They should be made sufficiently large, however, to allow for a hole being made above the numbers to suspend them by on your hive. You then buy or borrow (I would not advise the latter) a box of stencil figures numbering from one to ten, and with these you can very easily make as many numbers as you may require. For my own I had all the numbers cut out of the zinc, but I would not advise this plan it being not only more expensive, but not so distinct. You are to paint well the pieces of zinc or tin before you paint the numbers with your stencil figures and a special brush for this purpose. You then suspend one of these to each hive by the help of a hook or screw so arranged that it will not blow or fall off, and yet so as to be easily removed when the colony sends out the first swarm; a small screw with a large head which is filed flat on two sides, so as to be long and narrow will answer. You then make the hole above the numbers so as just to go over this; now you will readily see that the screw can easily be fastened to the hive, the opposite way, lengthwise to the hole above the number, so that the latter would have to describe a quarter circle before it would come off. If you think necessary you can make an additional arrangement beneath it, for it to slide under, but I do not think it is required.

Now you are to have a record of each queen in your book, the number on the hive corresponding to the page on which this record is put.

For instance, the hive to which No. 10 is attached contains a queen fully described on page 10 in your book or on a page the same as the number in the hive. No experienced beekeeper will question the utility of this, but to a beginner an explanation might be of service.

The object in this is to enable you at any time to know what queen a certain hive contains, that is whence obtained, her age, and any remarks you think necessary concerning her offspring. It is best to know how old she might be, so that you will better know when to rear another in her place, or when it will be likely for the bees to do so themselves, and which some beekeepers prefer. It is certainly advantageous to know whence obtained, because you can in this way better improve your stock, by only breeding from those which give a good account of themselves. An example of this may not be amiss.

You wish to know about a queen in a hive to which No. 54 is suspended; you simply turn to page 54 in your book and you find there "Italian queens from A. I. Root, July 16, 1884," or "Queen cell from No. 29, Aug. 5, 1884." Now if you wish to improve your stock it will be necessary to observe closely what each colony has done and how near your

standard of perfection it has reached. To better enable you to do this take some number as a standard to be desired but not attained, and then the nearer they reach the number, the nearer they are to your standard and so only breed from those that are the highest on your record or that attain somewhere near it. E. A. Thomas suggests the following classification: First, industry, second, docility, third, hardiness, fourth, prolificness, fifth, color. The first two of these are all I would occupy my time with, because for "hardiness," the very fact of a colony existing as a colony sufficiently long enough to test their working qualities is proof that they should not be condemned on this score; and then as for "prolificness," if the queen is so prolific that all the stores are consumed in feeding young bees, then she will be condemned under the head of "industry," for I am not particular about a queen being very prolific so long as I get plenty of surplus honey. As for "color" I think it deserves only a passing notice; I would never breed for color nor would I reject a colony because of it. There are then two qualities that we are to record, namely, industry and docility; the latter is certainly very desirable, but I would never sacrifice the former for the sake of it. What I look for are large returns in the shape of marketable honey, and if I can have them docile withal, then I rejoice in this also.

The number is made movable on each hive, so that when any colony swarms taking the old queen with them, all you have to do is to remove the number to the hive you put them in, and its record in your book remains as it was, unless the queen is disposed of in some way. To have a permanent number on each hive is practically useless, unless you are willing to go to considerable extra trouble. In keeping a record of industry, it will be necessary to make a note of the hive from which a swarm issues, so as to take the products of both into consideration when making your estimates at the close of the honey season. With a record such as I have described you will be enabled to make correct comparisons between young queens from any colony that has been mated with drones of other races.

Brussels, Ont.

EDITORIAL.

We are pleased to learn that the beekeepers are at last awakening to the fact that American apiculture demands some protection of its interests and welfare, through a more thorough and systematic organization of its forces.

Ever since our journal was started we have endeavored to keep this matter prominent before the minds of our readers, and all our efforts at conventions, and in fact everywhere, have been centred in this one great and grand work.

It has appeared somewhat strange to us that our more aged contemporaries have carefully held their peace on this subject until compelled by the "Freeborn case" which is now being so freely commented upon, to

take immediate and effective measures to protect the interests of the beekeepers.

Perhaps our journal represents one of the "children" so quaintly referred to in the "A. B. J.," No. 25 of the current year, by its editor, and quite likely the older journals have been vexed by our "prattling;" but we are well aware, as we always have been, that younger journals are entitled to the same gentlemanly treatment and journalistic courtesy that the editors of the former so much desire. In our experience, public teachers command respect in proportion to the practical value and worth of their teachings; and would they avoid annoying and vexing criticisms, they must conduct themselves in such a manner as to merit and call forth only commendation.

There are those who attempt to please everybody, and who are never known to take advanced or aggressive positions, especially when their own personal interests are endangered and they always object to any movement of reform not born of their own efforts. A short time since, the editor of "Gleanings" trusting (we suppose) thereby to doom to eternal silence and oblivion these "prattling infants," published an editorial so devoid of reason, logic, justice or right, that we were surprised when the editor of A. B. J., holding the position that he does, should give place to it in his journal.

Our aged contemporaries who alone talk so much about jealousy, etc., should remember that all things do not improve with age, and that because a bee journal has managed to live for an extended period, it is not convincing or conclusive evidence of its right to claim the "highest seat" and "most honored position;" doubtless it is annoying and vexing to have the "younger journals" continually spurring on to duty these old war horses tired and weary with the strife, but it may awaken them to renewed action and do them good.

Peace and quiet is a glorious boon but a crown of discredit when purchased by the sacrifice of the interests of those in whose behalf we are working. Death on the field, amid the roar and tumult of strife, is an honor, and yet oftentimes those who stay behind, enjoying the quiet of their peaceful homes and replenishing their coffers at the expense of the life-blood of these dying heroes, pluck all the laurels. Public sentiment is a fickle thing borne on the wind of prosperity and success and controlled by ever-varying circumstances, only too frequently favoring those in power to the sacrifice of those who are struggling to protect and further public interests.

How often within the memory of our readers have various reforms been slighted and neglected, until those who had toiled the hardest through the heat of the day were "resting with head pillowed upon the lap of mother earth," oblivious of the credit awarded to their memories, or the laurels which crown their tombstones.

The older journals have of late taken to giving fatherly advice and are now urging us to lay one side "petty strife" and jealousy, and work

hand in hand with them for the interests of the majority.

Silence on our part simply admits that we accept the unjust and misrepresented position tendered us by the former.

Whatever may have been the *raison d'être* for the other "young journals" the "APICULTURIST" was instituted to fill a place until then occupied or filled by no other journal, and instead of holding our peace at the dictation of others, or faltering in the one aim of our life, we propose to speak whenever we deem that the interest of the beekeeper demands it; and we would ask our contemporaries to remember that the mere assumption that we have misrepresented and abused them, to the extent that we are not to be considered "gentlemen," will do for those who never become aught else than children no matter how great their age.

We can only be silenced with reason, logic or proof; we never mean to be defeated with paper air-guns. We have, in our opinion, made all our statements in a fair and manly way, but we never proposed to pick the thorns out, and if our contemporaries wish to prove us in error they must do it by taking the same course or forever hold their peace. Past records are the criterion, not present assumption. Perchance our contemporaries may learn this in the early future and not administer these parental spankings without first proving us to be guilty of misdemeanor.

It is really too bad that after reporting us dead, preaching our funeral sermon and announcing our resurrection, they at last attempt to punish us again before admitting us to their ranks. This even surpasses the cruel treatment of some of the young Indians who are passing through the ceremonies which entitle them to the position of men or braves.

Well, we have managed to struggle through it all thus far (no thanks to our contemporaries) and perhaps we may be able to survive the rest.

Mr. Newman in a late issue of the Bee Journal says: "Now let us have no more of such *nonsense* but let the bee papers (how the term bee journal troubles him) *get down to work* for the good of the pursuit of beekeeping, if that is the object of their existence."

Why! that is just what we have urged from the commencement, and Mr. N. is but repeating our advice; but we differ somewhat, perhaps, in regard to the meaning of the term *nonsense*.

In accepting the position of temporary vice president in the Beekeepers' Union now being organized, we have done so trusting that we may give our support to an object, the intention of which seems to be to protect the interests of the beekeepers.

At present this seems to be the best means of commencing proper organization, but we should forget our duty if we neglected to explain our views upon this subject.

It is better to look matters squarely in the face at the commencement than to find in the near future that

our energies, talent and money have all been expended in supplying one demand of our interests to the neglect and injury of others of equal or even greater importance. And in our mind it is well to consider that with a properly organized system of beekeepers' associations representative in their character the same results could be accomplished, and at the same time all other interests protected and fostered. It is needless to repeat all that we have written on this subject as it can be found in our back numbers, and we trust that those of our readers who have not followed us through it will secure our bound volume and become acquainted with the course that we have taken.

We see no reason why all that is desired cannot be accomplished by our National Beekeepers' Association, endorsed and supported by the beekeepers in every state in the Union.

Neither do we see any cause for forming a distinct organization which will have a tendency to retard the work of establishing a thorough system of associations. We may err but we are always open to conviction, and eager for truth which will enable us to work with better effect for the welfare of apiculture; either the Beekeepers' Union and the National Beekeepers' Association must meet in conjunction and be conducted and controlled by the same officers, or we shall be as deep in the mud as we (in the past) have been in the mire.

We can justly inquire what marked advances the beekeepers' associations of the United States are taking. Are they working up a demand for our honey, instituting better means for disposing of the same, simplifying the methods of teaching apiculture, establishing properly conducted experimental schools, or are these problems being solved in a large measure by individual enterprise?

If our contemporaries wish to "work," here is a vast field for action almost overrun with weeds, nor has it seen the editorial cultivator for many long years until the present.

Visiting a field occasionally and tearing out a handful of weeds will never assure a crop. The entire ground must be turned over and over again and again and if one will not attend to it another must, else but a poor crop, if any, will be the result.

If the beekeepers and our brother editors will go to work right, and stick to it, it will be only a brief interval before we have a National Beekeepers' Association representative in character with affiliated associations in every state and, we trust, in every county in the United States. When this is done we need not fear to claim our rights before any assembly of people, and apiculture will command the respect which is its just due.

It is useless to evade this question. The large majority of beekeepers never can attend the National Convention and yet their interest demands that they shall be represented there.

We trust that amid the excitement, created by this new movement, the matter of association work may not be forgotten or neglected.

We urge every one of our readers to become a member of this "Union" and support with their money and advice every effort made to protect our interests.

Send to Mr. Thos. G. Newman, 925 West Madison St., Chicago, Ill., for constitution and by-laws.

NEW OBSERVATIONS ON THE NATURAL HISTORY OF BEES.

By Francis Huber.

(Continued from p. 133, Vol. III.)

This experiment is decisive. Since the eggs laid by the queen of a hive where there were no males, and where it was impossible one could be introduced since these eggs I say were fertile, it becomes indubitable that aspersion with the masculine matter is not needed to effect their exclusion.

Though it did not appear that any reasonable objection could be started against such an inference, yet as I had been accustomed in all my experiments to investigate the most trifling difficulties which could occur, I conceived that Mr. Debraw's partisans might maintain that the bees, deprived of drones, perhaps would search for those in other hives, and carry the fecundative matter to their own habitations for the purpose of depositing it on the eggs.

It was easy to appreciate the force of this objection; for the only thing necessary was repetition of the former experiments, and confinement of the bees so closely to their hives that none could possibly escape. You know very well, Sir, that these animals can live three or four months confined in a hive well stored with honey and wax, if apertures are left for circulation of the air.

This experiment was made on the tenth of August; and I ascertained, by means of immersion, that no male was present.

The bees were confined four days in the closest manner, and then I found forty young larvæ recently hatched. I extended my precautions so far as to immerse the same hive a second time, to be assured that no male had escaped my researches.

Each of the bees was separately examined and none was there that did not display its sting. The coincidence of this experiment with the other proved that the eggs were not externally fecundated.

In terminating the confutation of Mr. Debraw's opinion I have only to explain what led him into error. He employed queens in his experiments with whose history he was not acquainted from their origin, when he observed that the eggs produced by a queen confined along with males were fertile; he thence determined that they had been bedewed by the prolific matter in the cells.

But, to have rendered his conclusion just, he should have first ascertained that the female was in a virgin state, and this he neglected. The truth is, that without knowing it he had used a queen after her commerce with the male. Had he taken a virgin queen the moment she came from the royal cell, and confined her in his vessel along with drones, the result would have been opposite; for even amidst a seraglio of males the young queen never would have laid as I shall afterwards prove.

The Lusatian observers and Hattorf in particular thought the queen was fecundated of herself without concourse with the males. I shall here give an abstract of the experiment on which the opinion is founded.

Hattorf took a queen whose virginity he could not doubt. He excluded all the males of the large, and also of the small species, and in several days found both eggs and worms.

[*To be continued.*]

EXPERIMENTAL BEE FARM NOTES.

We have been longing for a resting spell when we could devote some of our time to experimenting with the bees but it has been one continual rush and drive ever since spring opened. We even worked the larger portion of the "Fourth." Well, rest must come ere long.

We seldom remember a time when the bees seemed so. panic-stricken with the swarming fever as during the past month.

The bees commenced operations all *at once* and swarm they would in spite of every precaution and we sometimes had from five to six swarms in the air at once.

Where the hives were supplied with drone traps no difficulty was experienced, as we had the queens ; and the bees, if they united in one cluster, could be easily and quickly divided.

But many colonies unprovided with traps cast swarms which united and the queens got mixed up.

This is quite annoying and we know of but one remedy for it, viz., the honey extractor.

We have just received a note from one of our subscribers in California, to whom we had shipped a queen. He says that "the queen was received safe and in fine condition, with not one dead bee in the cage." This seems refreshing after finding that sometimes a queen just as carefully prepared for shipment will die before reaching a customer who lives within 100 miles.

A short time since on opening one of our nucleus hives containing queenless bees, we discovered one young bee just hatched which was so pure white and transparent that we almost went wild over it. Some one secured the mother of that bee, as we had sent her out. Had she remained in the apiary until we saw that bee, no money could have secured her.

We have at last completed our shipping-cage, which is a combination of many of the good qualities found in others and one new (we think) feature.

We are tired and weary of having so many persons write that they had received the queen all right, but failed to introduce her successfully.

Never disturb your colony for three or more days after a queen has been introduced. If the bees have begun to ball her you cannot do her much good, because oftentimes they simply bother her for a while and then let her go ; but, at any rate, the chances of loss by this early disturbing of the bees after introducing the queen too frequently result in her death.

After many experiments with frames of every character and description, we have, through our superintendent, secured one which at present promises to supersede all others. We shall experiment with it still more fully.

The season with us has been a peculiar one, and the white clover is more abundant perhaps than for ten years prior to this time and the bees have been storing honey well from it.

One of our neighbors near our Albino apiary has a large tract of alsyke clover and it is wonderful how the bees will work upon it and the flavor of the honey produced from it is delicious.

Our superintendent who does not agree with Messrs. Dadant & Son, that the drones from laying workers, or other small drones, will pass through the zinc on the "drone traps," tried the following experiment lately :

One of our nucleus hives was abundantly supplied with fertile workers and their progeny. A few of the drones were confined in a cage covered on one side with "Jones' zinc," and they remained there until they were all dried up and withered.

We should be pleased to have Mr. D—— send us some of those drones that will pass through the Jones' zinc; we would like to examine them.

We have lately been using some fine foundation that we received from Messrs. Dadant & Son and it works like a charm. That received from Mr. Falconer was also fine, but we received from one other party some that would sag badly in spite of all that we could do. We are unable as yet to give any reason for this, excepting that from some cause at present unknown, the wax was too pliable and elastic.

Perhaps Mr. Dadant will explain the cause for this sagging of the foundation. The samples referred to were quite heavy and seemed to be made of fine, pure wax.

Our sweet clover and comfrey are doing finely, and we have sown two acres of silver hull (the best) buckwheat. This is to keep our full and nucleus colonies busy after the main sources of honey are gone. Nuclei must be fed when pasturage is scanty and but little honey is being stored, else they will continually swarm and mix up the queens and "raise your dander."

New subscriptions are coming in so fast as to keep us busy and we are pleased to know that the queen bees sent in connection with the journal give such genuine satisfaction. Occasionally one will secure a queen whose workers will not all be well marked, but she will prove none the less valuable or prolific.

While the beautiful bright yellow queens are handsome and good, otherwise, yet we prefer the rich orange hue; it seems as though queens showing the latter produced more hardy progeny.

We are now selecting and testing our stock for another season which will give us time to compare our queens critically.

Unfortunately our time is so taken up with the queen business and the Journal that it has been impossible to do much with getting surplus honey.

We find that if, after a colony has cast a swarm, you introduce a laying queen at once into the old colony much time is saved. We have always found it an easy matter to do this.

The season thus far, since spring set in, has, in our locality, been a very fair one for the honey business, but a trying one for queen-rearing.

Everything seems to warrant a fine crop of honey wherever the basswood is abundant, as our correspondents report that the trees seem full of buds.

We have seen no good reason as yet why the best grade of honey should be stored in sections without separators and unglassed.

So long as honey remains a luxury the better class of purchasers will not find any fault with the glass and will even call for it. It may be well for some to get up an excitement on a "special" style of sections, etc., but "the proof of the pudding is in the eating."

It is well perhaps to secure a portion of the crop in the one-pound sections, but we prefer for all purposes the $5\frac{1}{4} \times 5\frac{1}{4} \times 2$ *glassed*.

What can have quieted the excitement over the "reversible frames" so suddenly? Perhaps like the restless wave which spreads its strength on the beach, this subject has merely receded to gain force; well, any thing for a boom. It pays some one perhaps(?) who?

What a wonder it is that one colony that we have at Salem and one that is in a hive which has remained in one position and has been undisturbed for fully twelve years, never perished during the cold winters, as it had no protection and was of course filled with "pollen" which to our knowledge the bees never re-

moved from the hive *just before winter*. There are doubtless reasons why pollen will sometimes cause the bee diarrhœa, but if one will take a lot of bees, put them in a hive provided with comb foundation, feed the bees with sugar syrup food and let them build comb, then, if there be any pollen, remove it all; place the colony in winter quarters, then shake or rap the hive occasionally each day during winter, we warrant as a result of this experience that the experiment will bring about a genuine case of pollen dysentery (?); at least the bees will give up the struggle.

After our busy spell is over we propose to take time to experiment some and see how about this "pollen theory" and some other important matters.

INSTRUCTIONS TO BEGINNERS.

BY THE EDITOR.

It would be very pleasing to us if our readers could be with us in the apiary and listen to the talks that we are now obliged to put on paper, and we shall in all our instructions try to avoid the old ruts and stereotyped methods and imagine with our readers that they are really present: this will add novelty to the value of the instructions.

We had intended to talk about beehives and illustrate them this month; but owing to our many cares and duties and new developments in hives, and frames, we must defer this until we have more leisure, when we trust to be able to make up for the delay.

Each day as we work among the bees we recognize the value of an intimate acquaintance with our pets and their needs and wants; and as one regards this feature of the business and incorporates it into his daily conduct in the apiary, he finds it more easy to accomplish each allotted task and success is assured.

Last month we confined our remarks almost exclusively to introductory suggestions preparatory to acquaintance with the bee itself.

This month we shall take up the subject of bees, giving only the necessary information, as all the works on apiculture provide the rest.

THE HONEY BEE.

A colony of bees will contain from 40,000 to 60,000 bees, one queen (or mother bee), and, during some portions of the season, a few hundred drones; although, if there is an abundance of drone comb and the queen rather old, the colony may be overrun with drones.

THE QUEEN OR MOTHER BEE.

No sweeter nor more appropriate name could be given the queen than that of the mother bee, for she is the mother of all the bees and the only perfect female in the hive. In laying the eggs she performs all the duties that seem to be allotted to her.

FIG. 1.

True, poets have ascribed many beautiful and touching lines expressive of her royal power and dignity, but those who are most familiar with the habits of the bees have learned beyond a doubt the queen is subject to the will and wishes of the majority to a great extent at least.

However, here is a field for the studious and inquiring mind, replete with treasures for those who are given to investigation.

Fig. 1 gives a fair representation of a queen, although it is slightly larger than a laying or fertile queen. In shape she is unlike either the

workers or drones; her abdomen is longer and larger (when fertile) than that of the worker, but not so large as that of the drone; the head and thorax of the queen are larger than that of the worker, while they are smaller than those of the drone.

The wings of the queen are short in proportion to the body, this being, quite likely, because she seldom needs to use them. When moving about on the combs the queen does really appear dignified and majestic, and it is not at all strange that one who has a poetical mind or a vivid imagination should call her queen. Her movements are generally slow and matronly, but when necessary, she can move about quite rapidly.

In color the queens are, as a rule, rather darker on the upper side of the body than the workers, and the two posterior legs and under portion are of a golden yellow. Her abdomen is generally devoid of the hair coloring which is found on the workers and drones. The queens, even of the same race, differ greatly in color, some being much darker than others.

The conduct of the worker bees in their treatment of their mother is most touching; while attending to her duties she is constantly surrounded by a circle of her loving offspring who testify in various ways their affection and regard; some lovingly fondle and embrace her with their antennæ, while others approach her and offer her honey from time to time.

Could these same evidences of love and affection be carried into and made a part of every home circle, social life would prove more as our Heavenly Father wishes it to be.

Should the queen be removed or lost, excitement and despair seem to reign supreme for a time; the laborers abandon their work and join in the search for their queen, running excitedly about the combs and even leaving the hive in their efforts to find her. If they are unsuccessful they return disconsolate to their home thus made desolate, and in mournful tones give expression to their deep grief.

The experienced apiarist as he passes by his hives can easily detect any of the queenless colonies, as the tone of the bees at such times is peculiarly mournful, and cannot possibly be mistaken for the happy hum that comes from a contented colony.

After the bees realize that they must replace the missing queen and commence to build cells, this tone is diminished somewhat and is not so easily detected.

On an average the queen will deposit from 1,000 to 1,200, and sometimes 2,000 eggs, in twenty-four hours.

When five days old the queen leaves the hive for fertilization, provided the weather is pleasant.

Quite frequently our visitors ask us where we are likely to find the queen when we open the hive, and as this is a matter which will interest our readers, we quote from the "Bee-keepers' Handy Book:"

"During the brooding she wanders about from comb to comb depositing eggs wherever she may find cells prepared for them, and occupying no particular portion of the brood-nest: when the season's work is completed and breeding has ceased, she may be found in the centre of the brood-nest surrounded by the cluster." We also quote from the same source the following foot-note: "When examining a colony for the queen, bear in mind that her ladyship is usually found, at noon time near the centre of the brood-nest, when, after depositing an egg in each prepared empty cell, she will gradually work back to the combs at one side of the hive, and during each twenty-four hours she will visit twice, all parts of the hive while brood rearing is going on."

The queen is provided with a sting

which is curved and which is seldom or never used except to destroy a rival queen.

The average age to which a queen attains is about three years, but for our use we prefer that most queens be superseded when two years old. This is not necessary, however, except where one is forcing the queen to deposit a larger number of eggs during the first two years than she would if left in a natural condition.

THE WORKERS.

The worker bees (Fig. 2) comprise the majority of the population of the hive and they are smaller in size than either the queen or drones.

FIG. 2.

The workers are undeveloped females incapable of laying eggs excepting when they become what are called "fertile workers," when they only lay eggs that will produce undeveloped and imperfect drones; and hear we would caution the beginners against allowing any colony to remain queenless for any considerable length of time as when once the "fertile workers" infest a hive it is almost impossible to introduce a queen there.

Upon the workers depend all the labors of the hive, those performed by the queen being excepted. The following description of their duties which we quote from the "Handy Book" is a complete one.

"They build the comb, the construction of which seems to us so marvellous: collect the pollen and honey and store them for future use; protect and care for the brood-nest by clustering about it, or fanning with their wings for ventilation when too warm. They also act as warriors defending their homes against intruders.

It is needless to state that the worker is provided with a formidable sting which is made use of to the sorrow of the intruder whenever the worker is provoked. If the apiarist is cool, makes no quick motions, never gets excited nor becomes careless, the bees are less liable to become vindictive and will prove far more agreeable as neighbors. They are also furnished with an exceedingly curious and complicated tongue which it is needless to describe here. It is however an interesting object for study to the student and we would refer the latter to the standard works on apiculture for a description.

The hinder legs of the worker are furnished with a spoonlike cavity wherein she carries the pollen gathered from the flowers. When the workers are between twenty and twenty-one days old (from the depositing of the egg) they emerge from the cells, and for the first two weeks following remain in the hive (except when they take an occasional flight for exercise) nursing and caring for the brood, and attending to other duties. After this they assume the regular duties of the worker bee.

During the working season the workers wear themselves out in about six weeks but those hatched in September will live until May, as during that period they have but little labor to perform.

THE DRONE.

The drones, or male bees (Fig. 3) are larger, stouter and more clumsy than either the queen or workers; although their bodies are not quite as long as that of the queen. They are unprovided with a sting or suitable proboscis with which to gather honey from the flowers; they have no pollen baskets on their thighs and no means whereby they can secrete wax. Hence they are physically unqualified for any office excepting those of impregnating the young queens, and even this causes their

death; as, during the act of copulation, the male organs are torn from the bodies of the drones and the latter immediately expire. They usually appear about the last of April or first of May or in about six weeks after the bees commence carrying in pollen.

FIG. 3.

As sexual intercourse takes place while the queen and drone are high in the air it becomes necessary that many drones be reared where but few are needed. In large apiaries it is only necessary to keep one or two colonies rearing drones and the "drone trap" or honey knife should be used to rid the apiary of all the rest.

In July or August, or, indeed at any time, when there comes a honey dearth or season of scarcity, the bees, seemingly recognizing the fact that they must reduce family expense, ruthlessly drive the drones from the hives sometimes stinging them, but more frequently gnawing the roots of their wings so that, when once driven from the hives, they cannot return. Oftentimes they will be found hanging in clusters on the front and bottom boards of the hives.

CORRESPONDENCE.

THE HONEY EXTRACTOR.

MR. EDITOR: At your request we will give our views in answer to Mr. Clark's article on page 136.

Mr. Clark is right when he says that the *injudicious* use of the extractor is a damage to beekeepers, but it does not follow from this that we should discard the honey extractor. The injudicious practice of artificial warming is also very damaging, as many beekeepers divide their hives till their colonies are all too weak to winter. And yet, artificial warming is undoubtedly greatly beneficial to practical beekeepers, when properly done.

In a well organized apiary, run for extracted honey, the apiarist will never extract honey from the brood chamber, or at least so seldom that the exception is not worth mentioning. The main requisite is to furnish the bees with sufficient empty comb above the breeding apartment to prevent them from crowding the queen with honey. Where this is done, the breeding chamber will never contain more honey than the bees need to winter on, and the extracting from brood comb will be avoided.

In regard to the "glutted" market for honey, we would say that in this business, as in all other occupations, the man who tries to find a market usually succeeds; but he who folds his arms, and finds fault with his neighbors for being in the same business as he is, will never do anything. We raise large crops of honey every year, raised 36,000 lbs. in 1883, and we have never failed to sell our honey (extracted) at remunerative prices. Let Mr. Clark "annihilate" his extractor if he cannot use it properly; we will nevertheless continue to employ our large four-frame extractors, and thus save our comb from one season to another.

CHAS. DADANT & SON.

REPORT FOR 1885 ON WINTERING.

DEAR SIR:

The early part of March I shovelled out my bees, ninety-three colonies, which were all living; some were in splendid condition, while others were considerably weakened by rushing out of the hive,

caused by uneasiness, which is always the case. My bees have wintered so far, better than they did last winter, on account of not being so long confined; they had a fair fly the early part of last January, which they did not have one year ago. The spring so far has been very unfavorable, as the weather was not quite warm enough, when they were shovelled out, for them to have a good fly which I think very essential, as they will then return and be contented for some time; while as it has been this spring they keep coming out, never to return, every time the cold lets up a little. We are now having one of the coldest spells of weather we have had this winter.

It is a wonder to me that so many of our best apiarists suffer such losses. I have always claimed I could winter bees as safely, according to the number kept, as other stock. I stated this to Prof. Cook at the State convention at Lansing last winter. He said "there is time enough yet." I have wintered six winters and I think we have had a fair average; should I lose, I would say I am liable to lose other stock, as I lost 12 sheep this winter out of 75 by some unknown disease.

I have had the misfortune to lose, by fire, my honey house and shop combined, consisting of 1,100 lbs. of comb honey, 150 of extracted, the surplus to 75 Doolittle hives, all of my tools which were not few, 7 saws, 7 planes, 3 draw shovels, 2 coal chisels, augers, bits and chisels from 2 in. down to $\frac{1}{8}$ in.; in fact, I had almost everything a person needs to carry on an apiary. The morning of the sixteenth I went to the shop, started a fire and returned to do a few chores at the house while it was getting warmed up. I did not think I had been in over five minutes when I noticed the smoke. I think it started where the pipe entered the chimney, as that was the only place where fire was to be seen; everything was supposed to be perfectly tight, unless something fell from above and knocked the pipe out. I have no clew as to how it happened. I only know it did. It burned very quickly, as it was well filled with hives and other dry material. I lay the damage at $1,000, insurance $375. I do not wish to be placed in the "blasted hopes" column, although I feel as though I could make but little headway this season; still I shall try and raise enough honey for our own use, as we are very fond of it. I have the material on the ground for a new building and have got my tools to-day, so that as soon as the weather changes we shall put up the building and then I can proceed to business.

P. S. I am very much pleased with Vols. I and II of "American Apiculturist." I think it well deserves a place in every beekeeper's library.

A. P. COWAN.

Grattan, Mich.,
March 20, 1885.

NEW YORK AND FLORIDA.

Our bees in New York state were set on their summer stands after a confinement of one-hundred and fifty days terminating Apr. 19, 1885, in much better condition than we had reason to expect. Our loss of bees in cellar was four per cent, but after setting out it was necessary to unite several colonies which increased it to eight per cent. The bees came out with little or no brood, which with the cold weather that came, the last of April, made it very bad for the colonies that had to wait for the young bees to hatch to replace the loss caused by the old bees dying. And as a natural consequence, by the first of May our bees were much reduced in numbers.

The past experience in wintering has taught me that in order to win-

ter successfully in this state we must have none but well-bred queens and the younger the better. Bees under these conditions will invariably come out with young bees hatching and will not feel spring dwindling, to any extent. Also, much care is necessary in preparing the top of our frames and hives. I have put one foot of chaff over the frames in cellar and had the worms drive the bees out and take complete possession of the combs. Then again I have used two inches with very desirable results. The past winter I used a shipping case made of quarter inch stuff and placed nothing on the top but the cover, part way over the frames, which gives the bees plenty of fresh air, and I am inclined to believe that by retaining the heat we also keep a large percentage of moisture to the detriment of the bees. Many winter successfully by putting a mat on top of the frames and then clasping a tight fitting box over and down on top of mat and frames. But with me such treatment would prove disastrous. Our bees in south Florida during the month of April worked nicely as long as the orange bloom lasted. By consulting my diary, I find, under date of April 16, the following note; "bees are letting up on the orange bloom to-day, yet no indication of robbing, which with the sudden cessation of our honey flow is marvellous." Our queens that were reared from pure Italian stock and mated with pure blacks of Florida are proving, so far, superior to any I have seen. Our queen-rearing was attended with marked success during the month of March and first of April. Then we were visited by a very unwelcome visitor in the shape of the dragon fly (see "Manual of the Apiary," seventh edition, pages 269-270); it is known as mosquito hawk, bee-killer, etc. These flies made their appearance about Apr. 10, and increased in number as the season advanced. Did not know how predaceous they were when they first put in their appearance, but soon found that they were the most disastrous enemy that we had to encounter while south. During the heat of the day and the early evening they simply swarmed in and around the orange trees, and the venturesome bee that reached its home without being captured might consider itself fortunate. If one should go among the bees and commence handling he would immediately be surrounded by such numbers of these insects that, if timid, he would be alarmed for his own safety. And looking on the trees he could see them hanging thick, munching each one a bee, in their spacious maws. While the bees are away working among the flowers these flies have no occasion to assemble in the yard as they can help themselves and catch a bee that is loaded, with more ease than otherwise. But soon as the bees come in from the field the bee dragon follows and spends hours in graceful gyrations stopping with lightning rapidity when seizing a bee and alighting upon the trees where you can hear them devouring the bee, which one soon recognizes by the sharp snapping sound of their strong masticating mandibles. If our friend A. J. Goodwin of New Smyrna, Fla., who is so bothered with ants (as figured in February No. of Apiculturist Vol. III, pages (34–36) is not troubled with these pests, he can congratulate himself, as they would with the ants soon destroy the best managed apiary, if the ants are as bad as he represents in his article. With me ants bother no more than North, in fact not as much, and I have no hesitation in saying that much is unjustly said against them when in reality the real cause is, the colonies have been allowed to remain queenless and after they become reduced in numbers, ants, moths and worms are found, and get the reputation of destroying

the colony. Many young queens in second and third swarms in the south are lost in mating and require much attention in order that they may be successful, especially after the bee dragon appears, as they are very fond of queens and are apt to be captured while returning home, which leaves the colony with no means to reproduce another. Many small bee-keepers here have three and four swarms from one, and upon examination found many that were queenless owing to loss of the queen on her wedding flight. As soon as I found the dragon fly so carnivorous I stopped rearing queens. In south Florida queens should be reared in the early spring months and also the best time to increase bees is before the hot weather appears. The saw palmettoes that I have spoken of before, that are so plentiful and from which I expected to get early honey, bloomed but little. They commenced trying to bloom in January and have just put out their first mature blossoms, so that the bees began to notice them. Its huge rival, the cabbage (so called), has shown but little signs of starting at this date. The magnolia blossom is no bee flower as its structure is such that bees can get little if any honey. The sweet bay, which is related to the magnolia, is also a poor honey producer yet very fragrant. It is well to understand what flowers we can depend upon for honey and the past winter has taught much in that direction.

The average temperature for March at 7 A. M., 54°, at 1 P. M., 83° 8 evening, 56°. Greatest variation during the day, 62°. For April at 7 A. M., in shade, 62°, at 1 P. M., 82° and at 8 evening, 63°; greatest variation 34°. Our bees, that were fed occasionally during the months of January and February, at this date are in much better condition in bees and honey. In our next we will give our experience in moving from a temperature of 90° in the shade, to New York, and with what success; also will try to describe the country, and to what extent it will pay to move bees south for the winter, and back in the spring before the pests of the south commence.

CHAS. G. FERRIS.

Sanford, Fla.

May 1, 1885.

NOTES AND QUERIES.

— Several parties are writing to us complaining of the dealings of Mr. George W. House.

We trust that Mr. House will attend to these matters, as quite probably he intends to do. It is sometimes hard to know just what to do in such cases, as we are not thoroughly acquainted with all the circumstances.

— The Haldimand Beekeepers' Association met May 29th at Nelles Corner, Ontario, 1.30 P. M. The President, J. Armstrong in the chair.

First topic for discussion: Report of winter losses and cause of losses.

Many attributed their losses to the fact that the stores were not placed compactly enough in the hive, and owing to the long and intensely cold weather the bees were unable to leave the cluster to secure food or if they did it was accompanied by a great loss of bees. Doubtless much loss might be avoided during severe winters, if sufficient stores were placed in as few combs as possible, and all superfluous combs removed.

We append the report:

Jas. Collins,	16–14
Geo. Warner,	5–1
Bassbinder,	50–46
M. Hunsberger,	10–0
Selkirk,	18–3
F. Mehlenbacher,	12–9
John Boyer,	13–12
R. Coverdale,	11–10
Kendree,	30–25

Vanderburgh,	36–30
Peter Anguish,	8–6
Lewis Miller,	20–19
J. Williamson,	10–8
Atkinson,	14–4
E. C. Campbell,	41–31
A. Buoyer,	20–6
J. Kendree,	10–1
John Hurst,	6–0
Campbell,	4–0
Gloyd,	6–1
John Lanjohr,	65–62
R. W. Beam,	23–14
A. Gee,	13–4
Rose,	30–22
R. Anguish,	42–32
Smith,	8–0
McKenzie,	4–2
J. Richards,	73–60
J. Colwell,	54–45
I. Overholt,	6–4
Havell,	2–2
Effenger,	17–12
Hoover,	2–1
O. Fathers,	20–18
D. Anguish,	33–9
Otterman,	7–5
F. Harrison,	4–4
Armstrong,	80–63
Stewart,	4–3
R. Buckly,	17–12
Jeffrey,	6–5
McKenzie,	5–0
Several,	91–22
	952–634

or 66⅔ per cent brought through.

This is not only the report of members attending, but a pretty full one of a large radius of country. We obtained the worst report from those not present which brought the average as above stated. Other topics presented for consideration were:

Shall we produce comb honey from the top or body of the hive?

The general impression of those having had experience appeared to be, in the shallow frame the top, the deep frame the body, as in the latter the bees were reluctant to pass over the piece of sealed honey above brood and store honey above.

How to sell honey to the best advantage. One or two advocated tins, but general impression appeared to be glass that could be utilized by housewives in canning, preserving, etc., with neat labels describing granulation and give name of producer.*

—As many of our readers do not clearly understand the change that we have made and think that Mr. Henry Alley is a member of the firm of Silas M. Locke & Co., we would state that our partner is Mr. Philip Morant formerly of Salem, Mass., and that Mr. Alley is in our employ as superintendent of our queen-breeding department; and here we would again extend a cordial invitation to our beekeeping friends to visit us. We will endeavor to make your visit both pleasant and profitable.

—It is with great pleasure that we learn of the improved condition of the health of the Rev. L. L. Langstroth and it is to be hoped that our readers may soon be favored with notes of interest from his pen.

—Mr. J. E. Pond, who has been a great sufferer of late and confined to his room, is now fast recovering and we trust will assume an active position among our correspondents.

—It is with deep regret that we learn of the death of the Rev. Robert R. Peel, late editor of the "British Bee Journal." Mr. Peel has been a great sufferer from gout in the head and eyes, and rheumatism.

We quote the following report of his death from the "London Standard."

"On Tuesday, June 28, Mr. Peel was missed from luncheon. His study door was locked, and on an entrance being effected by the window, he was found lying on the hearth-rug shot in the left breast with a

* A question department elicited information regarding sex of egg, fertile workers, etc., which was replied to by a beekeeper present through the article in No. IV, American Apiculturist, and was received with great interest as none present had the information therein contained.

double-barrelled gun at his feet, one barrel of which had been discharged. Death must have been instantaneous.

The jury returned a verdict to the effect that the deceased came to his death by a gunshot wound, but there was no evidence to prove how this was inflicted." Mr. Peel was born February 8, 1831, at Canterbury. His father was the late very Rev. John Peel, D. D., Dean of Worcester. He was also a nephew of Sir Robert Peel the eminent statesman. Mr. Peel resided at Thornton Hall, Buckingham, Eng., and was, until last year, Secretary of the British Beekeepers' Association which position he has occupied with great credit and with untold benefit to the beekeepers of Great Britain. He spent much time and means in organizing and supporting this association.

He was also since January, 1883, the editor and proprietor of the "British Bee Journal" regarding which the "London Journal of Horticulture" speaks as follows:

"Under Mr. Peel's management, the "British Bee Journal" for some years has been published once a fortnight, whereas formerly it was issued only once a month. Its circulation has largely increased and the most advanced beekeepers from all parts of the globe enrich its pages. The compliments paid to its proprietor (Mr. Peel) are only his due, for he has done more to advance beekeeping in England than any Englishman living; and the extraordinary advance of apiculture in England during the last five years must be attributed chiefly to Mr. Peel and the band of friends whom he has attracted to himself by his ability, energy, earnestness, and philanthropic desire to do good to his fellow-countrymen. Mr. Peel has made a mark for good, and richly deserves the gratitude and esteem of all right-minded men."

The British Bee Journal speaks very touchingly of the great loss sustained both by British beekeepers and his bereaved family through his decease.

The "American Apiculturist" extends its heartfelt sympathy to the bereaved family.

—The following note, kindly sent us by Mr. Newman, suggests a new and valuable field of labor which properly managed will prove productive of much good. We cheerfully accept any position that may be offered us by our brother beekeepers with the assurance that we will do our duty to the best of our ability.

We quote as follows:

"Let it be a national Union. Messrs. Dadant and Son make the following as suggestions: 'We are willing to put our shoulder to the wheel for a National Beekeepers' Union, and to pay our share, whether it may be $1.00 or $25.00. We suggest that a special request to unite in this Union be sent to all the bee-papers and their subscribers. We must have a National Union or none.'

This is 'good and timely,' and we publicly invite the editors of all bee-papers to unite in this noble work, and would cheerfully vote for the following as the officers of the temporary organization, if these editors will cooperate with the Union:

President—A. I. Root, Medina, Ohio. First Vice-President—A. J. King, New York. Second Vice-President—A. G. Hill, Kendallville, Ind. Third Vice-President—Silas M. Locke, Wenham, Mass. Fourth Vice-President—H. Scovell, Liberal, Mo.

This would unite all the bee-papers in the Union, and we sincerely hope that it may induce all of them to work together for the general good. As soon as the organization is completed, we will cheerfully relinquish our position to any one the Union may choose, but the BEE JOURNAL will give its unswerving support to the Union and all its officers.

If Canadians, who are governed by other laws, find such an organization

necessary or desirable, the editor and subscribers of the Canadian paper are all cordially invited to cooperate with this Union."

In order that the object of this enterprise be not defeated the organization must call into its ranks and on the advisory board some of our most prominent and successful honey producers, as such ones are more deeply interested in the success or failure of this Union than any others.

We trust that every individual aim will be lost or forgotten in our endeavors to establish this enterprise. It is a move in the right direction and should receive the hearty endorsement of the beekeepers. American apiculture and the interests of American beekeepers call for a thorough systematic organization of some character and we care not on what foundation it is built so long as it is conducted in the interests of the majority.

So long as it is properly conducted, our services are subject to the will and wishes of our brother beekeepers and we are only too pleased to be able to offer them.

QUESTIONS AND ANSWERS.

For some time we have urged the necessity for more system and union in association work, a department of apiculture which has been too much neglected and made subservient to individual aims and personal gain.

Just at present this lack of system and proper organization of our forces is becoming painfully evident and there is now being organized a "National Beekeepers' Union" which in our own mind would have been unnecessary if we had a thoroughly organized and properly conducted National Beekeepers Association.

In order that we may learn the opinions of those whose interests are most likely to be involved (the honey producers), we have decided to ask the following questions trusting that each one to whom these questions are submitted will answer them to the best of his ability for the benefit of his brother beekeepers.

1. In your opinion what will be the advantages or disadvantages occurring to the honey producers from the proposed National Beekeepers' Union?

2. Do you think it best that its labors should be confined to mere legal questions and legal protection, or should its province be broader and include the interests of beekeepers in every branch and department of apiculture?

3. Could not a National Beekeepers' Association be so organized and conducted as to prove all that would be needed and also prove even more effective and successful in its workings and results than a Beekeepers' Union?

4. What advice, if any, would you offer as to the proper organization of such a union?

ANSWERS BY A. J. COOK.

1. The advantages will be the protection of a member who is involved in a suit at law, in which we are all equally interested. If properly conducted I see no disadvantages.

2. It seems to me that aside from such cases as the one that called up the present Union, our societies, state and national, are better qualified to discuss and settle important matters.

3. Possibly so; possibly not. Many will join this Union, who will not attend and possibly would not join the Association. I think quite likely a more perfect organization would permit the association to do this work. It is not now organized for it, and so a new organization is called for.

4 Unless the National Association perfects its organization so as to do such work better, I have no criticism to offer on the present plan for a Union.

ANSWERS BY L. C. ROOT.

1. A National Beekeepers' Union properly organized and conducted in the best interests of beekeepers generally could not but result in good.

2. If it is simply alone for the legal protection of beekeepers I have some doubts of the good results. Legal points in such matters are usually agitated to the harm of all interested.

3. It matters little what the organization is called. If its aims are high and unselfish its success is certain.

4. I have but one suggestion to make as to the organizing a society—that is, to meet the demands. If it is to be a success, its officers and founders must be active, practical beekeepers; otherwise, it will not receive the confidence of beekeepers generally.

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FOREIGN NOTES.

BY ARTHUR TODD.

THE greater part of the work being done among beekeepers of the nations outside the United States of America is practically unknown to the average beekeeper of this favored land. With the exception of an occasional translation of an article, little appears in the journals to keep all "*au courant*" with the march of apistical events abroad.

The great majority of beekeepers cannot read French, German or Italian; hence, even if they did receive foreign journals, they would be a sealed book to them. It appears to me to be the duty of the publisher of a leading bee journal to do the translation that his readers are unable to do, and from the mass of facts, many scientific, many purely interesting, collate such as will give the gist of the work going on abroad.

Great minds are at work across the seas: their names, their work, totally unknown to the beekeepers here. This should not be. The average reader should be put in the way of knowing who these men are, and their work. So that, for instance, when Giotto Ulivi is spoken of the hearer's mind will at once throw on the mirror of memory: "Ah! that is the parish priest way down in Italy who holds to the doctrine that queens are fertilized inside the hive."

Who of you has heard of Mr. Vignolles? Yet he was one of the thoughtful painstaking bee men of France and *the* one who undertook an exhaustive series of experiments to determine what weight of honey has to be consumed by the bees to produce a given weight of wax.

Sir John Lubbock, Frank Cheshire, Pastor Dzierzon and others have made their names household property and it will be our pleasing duty to bring prominently forward each successive step they take in the paths of discovery.

"Arrenotokia"!! Professor Cook may have known what that word meant, but the average beekeeper

does not, I feel sure. Now what is it? This word signifies that when a queen bee has her spermatheca completely furnished with spermatozoa, yet from some paralysis, or other defect of the muscles attached to the spermathecal glands it is powerless to act, and she becomes a drone layer. This condition in a queen bee can, it appears, be produced artificially by pinching the extremity of the abdomen so that the last ganglion is injured.

The introduction of queens is a subject interesting to all, and the "Simmins" method has lately received much attention; then we have a Mr. Reidenbach in Germany who constructs a small cell of wax artificially, puts the fertile queen therein, closes it up, and places it in the queenless hive.

Mr. Simmins has also started a dry sugar method of feeding, also a method of doing away with the trouble of boiling syrup by using cold water with the sugar. More on these points anon.

The sagging of certain makes of foundation when others do not sag is a point yet unexplained. A French writer says only last month (and he manufactures) "all qualities and kinds of wax are not suitable for the manufacture of comb foundation," and enumerates the departments of Normandy, Calvados, Picardy, Aisne, Pas de Calais, as only producing wax which, when made into foundation is accepted slowly by bees and very liable to pay.

There is undoubtedly great difference in wax: some is of a smooth texture and fine grain when broken, others again break with a very coarse greasy fracture. The art of the chemist may yet be profitably employed to determine the suitability of certain grades of wax for foundation making.

The making a market for honey is occupying the attention of our English brethren. Any and every one was induced to "keep bees," especially the cottager class, and then when they got honey there was no one cared to buy. An organized system of sale has been decided upon, and the British Honey Company is now fairly afloat with a capital of $100,000. Honeys will be received for sale on commission, each lot being graded on arrival. It will be wise to follow the workings of this organization, as if successful a similar system could be carried out here.

The Bee and Fruit Farming Co. with a $50,000 capital has also been started. Its object is set forth to be "To assist beekeepers by providing a ready means for disposing of the honey and wax now being produced on a large scale and to meet the difficulty experienced by so many in finding a quick market for their produce. The company will buy from its shareholders and also sell on commission.

Having had some experience as secretary, and manager of certain companies, I would simply say that if the right man for manager is chosen and then the President and Board of Directors go on a vacation and leave him thoroughly alone to manage, there is a poor prospect of success; but in England, as in this country, the ten-

dency is to "boss" the manager too much, and with the result that "too many cooks spoil the broth."

The prevalence of cholera it appears has had a bad effect on the French honey market. Let us hope that by careful sanitary conditions we shall keep the scourge away from our doors.

As time rolls on I trust the chatty "Foreign Notes" as now outlined will come to be looked on as a valuable feature whence new ideas will spring to help on the march of progress.

Phila., Pa.

BEE CULTURE IN THE SOUTH.

By G. W. DEMAREE.

THE past year has been a poor one for the prosperity of bees in a large portion of the middle states and in a greater portion of the south.

In the first place the past winter was an exceedingly long and cold one, extending far into the spring months; and to add to the discomfort of our weakened colonies the early part of the honey season was cool and otherwise unfavorable. And when the main honey season came in with white clover at its best, cool, rough east and northeast winds prevailed much of the time and lessened very much the honey yield; the result was that we got less than a half crop of honey.

Never before did my bees build up so slowly. Although there was plenty of bloom to all appearances, yet but little pollen was gathered, and to this cause I am inclined to attribute the tardy breeding up of my colonies. In an apiary of over seventy colonies I had but one swarm in the natural way, and I found it impossible to stock my queen-rearing apiary, to any great or material extent, without seriously damaging my apiary, and, therefore, I was compelled to remain silent because it was impossible for me to answer all, or even a material part, of the letters of inquiry about queens and bees which poured in on me daily. But this is the way the world goes, and I have learned not to fret. I have improved the time making some important experiments which have resulted in enriching my limited store of apicultural knowledge. By practising economy I have stocked about twenty-five nursery colonies, and have reared some extra fine queens for my regular customers, and shall continue these till late in the season.

Owing to the irregularity of egg-laying by the queens, brought about by the unfavorable weather, there was no regularity as to the age of brood in the combs, and this made it difficult to start good nuclei, and set me to work to overcome the defect.

When extracting honey I would transfer any combs of brood with adhering bees that the working colonies could spare, to a full size hive, till the hive was fully stocked with them. The bees were confined to the hive for twenty-four hours; then late in the evening a good queen cell was grafted into each of the ten combs, and the entrance to the hive was left open till next morning. It was then closed till late in the even-

ing, when the ten combs were divided into ten nuclei, giving each comb of brood, with queen cell and adhering bees, a comb containing honey and pollen. In this way I controlled most of the field workers and got the best of nursing nuclei.

As the science of modern bee-culture progresses, a desire to supersede *tolerated* defects in the system of manipulation is the more keenly felt. The proneness of bees to build "brace-combs" between the brood and surplus departments has led many apiarists to the conclusion that the present system of adjusting the surplus department of the modern frame hive is, in a great measure, defective. For this reason some have gone back to the old honey board system, claiming "improvement" of course, and with some show for their claims.

If I had the time and space I could point out the many devices that have been employed, or resorted to, to prevent the bees from filling up every available space with "bits of comb," and thus hindering the ready removal of the surplus department in a nice clean condition. But I will only mention the "slat honey rack" for holding sections, which is only another form of the honey board. Then we have the "slat honey board" finely slitted so as to act as a "queen excluder," and last of this kind we have the slat recess or "sink" honey board.

All these devices are subject to the same objections that may be urged against the "close top bar" frame. They in the same way conceal the tops of the brood frames from the eyes of the apiarist, and deprive him of the welcome sight of the whitened combs at the tops of the brood frames which he gladly receives as the best evidence that his bees are ready for the surplus department.

If we must tolerate the "bits of combs" or be deprived of a ready glance at the tops of the combs without first prying off a rickety honey board, I prefer a "close top frame," for it can be made in such a way that the bees can pass readily and promptly into the surplus department and not a bit of comb will be wedged in between the top and the surplus combs.

I have made, and am using, a few of these frames. They are the perfection of mechanism, and bring less labor to the apiarist than does the honey board system.

Christiansburg, Ky.

THE BIG DRUM.

By T. O. Peet.

Not long since I chanced upon the following article with the above heading. As when a boy it was the chief attraction in the band, so I was naturally drawn to it, read it, and was struck with its aptness of comparison to some of our bee conventions.

"When a band of music passes along the street, be it the band of a regiment, or a village band, or the band of a charity school, it may be noted that the chief centre of popu-

lar attraction is the drum department. The head-wagging, whistling, step-keeping crowd cares little for the piccolo, or fife, or trombone or cornet players; they are admittedly important contributions to the general effect, but are regarded as subordinate to the drums, and the centre figure of the drum department is the uncomfortable, irritable looking personage, who, tottering at an unnatural angle, thwacks upon the vellum of the big drum. We believe that the majority would rather play the big drum than swagger at the head of a column in a commissioned officer's uniform.

But there are big drums outside military or other bands. There are men in all assemblies or communities who make themselves heard, and command attention, much in the same way as the big drum of a band. A big drum who taps gently, and who does not take more than his fair share of space, would be unworthy of his position. Other men may have powerful instruments, but they must be kept in check, moderated, adapted to surrounding circumstances; but the big drum is bound by no laws or considerations. He has a big part to play, and if the other parts cannot keep up with him so much the worse for them. Better a loud big drum and feeble accompaniment, than a loud accompaniment and feeble big drum. What the other performers of the band are to the orchestral big drum, the rank and file of a social assembly are to the big drum of the convention."

It has been my privilege during my bee life experience to attend a number of BEE CONVENTIONS, each of which, I think, had at least, one *big drum*. It is generally a little difficult at the outset to get under way with discussions, as the rank and file usually seem diffident or reluctant to begin the music, but soon the big drum with the usual time beat comes to the rescue, and with deep resonant sounds strikes up the old time march, and away they go. The little pipers and players on small pieces fall into line, and pipe away the same old, worn-out tunes, among which are: "How shall we winter our bees?" "How shall we market our honey?" "Comb foundation;" "A standard frame;" Stimulative feeding;" "Dollar queens," etc. Oh! for some *Mozart* or *Handel* among our *beemasters* who will compose some new harmony, that will contain martial music that the veritable big drummer can master, so that we may learn to march abreast of the times, even if we must be led by the pompous beater of the vellum.

We were glad to notice that the N. E. Convention were constrained to notice the question of tariff as proposed by the new treaty with Spain. Why? It touches home. We fail to see any mention of reversible frame (as yet); perhaps when we see the full report it may be there. I tell you, gents, there is more in that new idea than many of you realize. Get the *big drummer* to practise on it. I think I see, too, a cloud in the distance (not yet bigger than a man's hand) hovering over a Pond, that is going to let fall some big drops by and by, that will *bee*come fertilizers to our Queens

and enlighteners to our Kings, and make new music for our big drummer. We trust more will come of it than was realized some years ago by the bee fraternity, who were led to look for great and startling developments by one of the big drummers; but, alas! it ended in nothing but noise like the buzz of a drone. Another big drummer was going to show us a "great light" that would solve the winter question, but, alas! it too ended in nothing *but droppings*, as the noise of the big drum ceased.

Among the many big drums that we have heard, we will recall a few which some of our brethren will recognize at once: "Pollen Theory;" "Apis dorsata;" "Holy Land Bees;" "Smoker Question;" "Coöperation;" "Chaff Hives;" "Foul Brood," etc. But like the big drum of the band, that would be no band without it, so these are necessary as it were in order to keep time, that the march of progress might go on keeping step to the music. Hurrah! then, we say, for the big drummer. May he live long and beat aloud the notes of martial music, and may we all recognize his importance and necessity among us as the DRONE is among bees!

Brooklyn, N. Y.

DRY FÆCES.

BY S. CORNEIL.

ON page 148 of the Canadian Bee Journal, Prof. Cook has an article regarding a lot of dry fæces received from me. Concerning one sample, he remarks as follows: "some masses are attached to the cloth above the bees; these are full of fibres which were undoubtedly torn from the cloth by the bees. Some of these masses, perhaps most of them, never went through the bees I think."

The pieces of cloth in question were cut from sheets of cotton placed over the bees last fall. In spring, I found some of them soiled with discharges, some of which were thin and were absorbed by the cloth; others were thicker, and were formed into cylindrical drops, not exactly on the body of the cloth but on the fibres of cotton, while others were evidently still less watery, and retain the cylindrical form in which they were discharged. The fibres were, therefore, not torn from the cloth by the bees, but adhered to the fæces while they were fresh and plastic, and I can see no reason for the shadow of a doubt that these masses did, every one of them, pass through the bees. But since Professor Cook and I now differ as to the nature and origin of a substance which we have both examined, I purpose to submit it for inspection to a number of prominent and intelligent beekeepers, both in Canada and the United States, and by concurrent sample post, I send a parcel to the editor of the "Apiculturist," with a request that he shall start it on its rounds, each one receiving it to send it on to the next person designated, and so on, till it has completed its journey and has returned to me.

Besides the masses which Professor Cook thinks never passed through

the bees. the parcel contains samples of dry fæces attached to chips from hives, etc., half an inch or more in length, voided by the bees on their first flight in spring, so dry that, when found, many of them were standing vertically; samples collected on the bottom boards beneath the bees wintered in the cellar; samples of the long sausage-shaped kind gathered from leaves in the garden during the present summer; specimens of masses consisting of wax, bee-hairs, fibres from the quilt, propolis, etc., rolled up in the cluster into pellets and cylinders and dropped on the bottom boards; specimens of wax and some other dark colored substance which I believe to be bee fæces, moulded on the inside of the posterior leg of the bee as the marks of the rows of stiff hairs plainly show; a specimen of matter dropped by bees on a sheet of paper in early spring during a few days when they were carrying in flour and collected by Dr. Tinker; and two specimens of fæces so fine that to the naked eye they seem like dust but are regularly-formed oval pellets voided by the larvæ of two or more species of beetles which were very plentiful in the debris on the bottom boards, in the cellar, towards spring.

Since opinions differ on a matter so apparent as the specimens on the cotton cloth, it is not at all surprising that there should be a difference of opinion as to the nature and origin of some of the matter found, in spring, beneath the cluster. If the gentlemen who receive the parcel, will take the trouble to give their views on the matter in dispute through the columns of the "Apiculturist," we shall feel pleased.

Lindsay, Can. Aug. 1, 1885.

INSTRUCTIONS TO BEGINNERS.

BY THE EDITOR.

ONE of the first questions asked us by the beginner and one that comes to us by every mail is, What is the most valuable race of bees for the honey producer all things considered?

In order to answer this question, and because it properly belongs in connection with the paper preceding this (July No.) we have decided to devote our talk this month to solving this problem.

We are aware that our opinion may conflict with those of other prominent and expert apiarists, but we can only give the results of our experience leaving our readers to test the matter and decide for themselves.

We are convinced, however, that were our queen breeders united in their efforts to establish methods for rearing better queens, and less given to getting up an unwarranted excitement over some new and almost unknown strain or variety, for the sake of popularity or individual gain, there would not be so great a diversity of opinion regarding other matters.

We have the Italian bee and know that it stands high in the estimation of a large majority of our most successful honey producers, and will always figure prominently among the valuable bees of the future; and yet,

as we have indisputable evidence that Italian bees formerly sprang from a common origin with the yellow European races, we feel certain that it will lose none of its identity, but be benefited by the addition of the blood of the original race, the Holylands.

We have in our apiaries to-day Albino bees (a freak of the Italians) which so nearly correspond with the Holylands, that it takes the most careful and critical examination of the expert to discriminate them.

We do not propose to give the history of the different races, but recommend to our readers "Cook's Manual" (latest edition) and the "Beekeepers' Handy Book" (both of which we keep in stock), as these works contain exhaustive descriptions of all the new races of bees.

It has always been our aim to devote a large portion of our attention to the development of the best bees for honey-producing purposes, and with this in view we have served a long and thorough apprenticeship with a number of the most prominent apiarists and queen breeders, including, among others, D. A. Jones of Beeton, Ont., Henry Alley of Wenham, Mass., and J. H. Nellis of Canajoharie, New York.

We have likewise visited a large number of the former many times and have been a constant attendant upon the beekeepers' conventions in order, if possible, to master this the highest branch of apiculture, for upon first-class queens or mother bees depends the success of the apiarist.

As with added experience we comprehend with what apparent neglect queen-rearing has been treated in comparison with other branches of the science of beekeeping, we are led to feel that we are as yet but students in one of the most fruitful fields of investigation and discovery, and he who claims that he has reached the ultimatum is justly entitled to the seat of the novice.

We refer to these matters not to gain popularity, but merely to show that our statements are based on practical experience and should command at least a small degree of attention.

The beginner, in stocking his apiary, wishes of course to feel sure that he starts out with the best bees for honey-producing purposes, and having little or no experience must rely on the judgment of those who place before the public their experiences and opinions.

It is always noticeable that, as a rule, those who are the first to speak and speak the longest and loudest are those who have had the most meagre experience, others waiting until thay have carefully tested the matter before venturing an opinion, and the advance of apicultural education has been many times retarded by this deplorable feature which can only be overcome through the agency of a thorough system of association work.

The Holyland bees were first imported into this country in June of 1880 and yet during the summer of 1881 numbers of apiarists everywhere were ready to pass judgment upon them.

Notwithstanding the severe criticisms to which this race has been subjected, it has been steadily gain-

ing favor until at present it stands (in the opinion of a large number of the most prominent apiarists) at the head, unsurpassed by any.

If the Holylands in the short space of time that they have been tested, have proven so valuable, what will be said when they have been given the same advantages with which American Italians have been favored?

The first essential with the majority of those who call for queens is, that they be beautiful, and in this regard we have never seen any bees that equalled the Holylands, and this concurs with the opinion of the majority of those who visit our bee farm.

It is claimed for the Italians that the test of purity is the showing of three golden bands or rings on the anterior portion of the abdomen; this marking being uniform, both in the number and color of the bands.

Those who are most familiar with the importation and breeding of Italian queens are aware that, as a rule, queens received from Italy do not produce workers showing a uniformity of this marking, and are further aware that, as a rule, the majority of imported Italian queens prove to be hybrids.

This comes not alone from the fact that European queen breeders do not fully understand queen-rearing, but because the Italian bees are the production of a cross between the dark and yellow races, and if left to themselves will retrograde, hence, in order to maintain uniformity of markings careful selection and breeding are necessary, which without caution will lead to in-and-in breeding, which destroys many other more valuable traits.

If you want beautiful bees, add to your best Italian blood the blood of the Holyland bees, and our word for it you will be pleased with the result. In order to prove valuable, our worker-bees must prove strong, active, energetic and correspondingly gentle. All this we have in the Holylands, and especially in the progeny of an Italian queen mated with a Holyland drone.

We are now so confident of the superiority of the Italian and Holyland bees that we propose hereafter to devote our attention exclusively to them and to their crosses, with the assurance that we can thereby do more toward developing better honey producing bees than by attempting to keep so many races pure.

The Carniolans have received considerable attention of late, but the majority of beekeepers would never be pleased with them as they show too much of the black markings and have a great propensity to swarm. For these reasons we have discarded them entirely.

It may be well to enumerate the requisite qualities which go to make up the best bee for the honey producer and see if we have in them those races to which we have given the preference.

1. They must be a hardy race, and able to withstand, successfully, the trying changes and severe winters of our northern climate.

2. Good breeders; keeping the hives well supplied with brood and young bees, from spring to fall, and even during the most trying portions

of the season, as success depends largely on populous colonies.

3. Gentle and quiet in their movements, thus permitting of easy manipulation, and this without diminishing their working qualities.

4. Good honey gatherers, energetic, determined and successful in their efforts to secure every drop of precious nectar, which circumstances will permit, storing and capping the same in an attractive manner, and fully as energetic and determined in protecting their stores and homes against the invasion of robber bees.

5. Strong and active on the wing, and capable of making long journeys when necessary without being exhausted.

6. Long tongued, in order that they may sip the precious nectar, as yet inaccessible to the bees, from the many honey-producing flowers which now refuse to yield up their hidden sweets, wasting them on the summer air; and, finally, beautifully and uniformly marked, also duplicating the above markings, qualities and characteristics.

Every one of our readers will admit that bees passing the above mentioned qualities, etc., are all that can be desired, and it is our purpose to show that the Holylands and their crosses with the Italians, or perhaps the crosses of the Italians with the Holylands, give us just what is required.

No race of bees will fly more rapidly or farther in search of honey when necessary, than the Holylands, nor are any more hardy then they; and while not as gentle as *some* of our American Italians, yet when properly managed, we have no difficulty in this wise.

As honey gatherers and breeders they are not excelled, and woe to the luckless robber bees which attempt to invade their homes and fall into their hands.

They have been known to fly (in Palestine) six and one-half miles to obtain pasturage. We (as previously stated) consider them a most beautiful race of bees, although their type of beauty differs from that of other races.

We have used bees for queen-rearing from nearly every race, and many of their crosses, and find that the Holylands have no superior for this purpose.

At Beeton, in company with Mr. Jones, we have witnessed large numbers of Holyland bees at work on the red clover (large heads) when there was a plentiful flow of white clover honey, and have known them to work on forage, in large numbers, farther from the apiary than the other races.

Most of our readers are well acquainted with the qualities of the Italian bees; they need no comment.

Our advice to the beginner is to purchase either the Italian or Holyland (those from Syria) or Italians crossed with Holyland drones. If one prefers to make his own crosses, it would be best to secure a Holyland queen and after obtaining some drones from her, mate with the latter some young queens from his best Italian stock; but, as a rule, it would be better to purchase the crosses reared by some reliable queen breeder.

And here we wish it plainly understood, that for just reasons we denounce, as we always have done, the cheap queen business, and if necessary we can prove by figures (and figures dont lie), that one cannot devote his time and attention to the proper care and management of the queen-rearing apiary and make it pay to rear first-class queens at the remarkably low prices at which some quote them.

For instance, we use a full colony of bees so populous that we are often obliged to keep them confined in two swarming boxes, one not being large enough, with which to start twelve to fifteen queen cells. Now we could start fifty cells with the same number of bees and have known it to be done.

Knowing full well that the bees should not be permitted to complete over fifteen, we are aware that where so many cells are completed the majority *must* contain poor queens.

We prefer to sell but a few queens at a fair price rather than to resort to lamp nurseries, deception, and lower our prices.

We wish to say, however, that some of those who sell cheap queens are conscientious and will give a good article even though it is at their own loss, but we are aware that in this, as in all other vocations and industries, low prices, as a rule, lead to deception and degradation of labor which it is our purpose always and everywhere to denounce.

EDITORIAL.

It is our purpose to be more brief this month than last, but as the "continual dropping of the water wears away the granite," and persistent agitating of any prominent subject brings it more fully before the people for consideration, we wish to speak once again on our favorite theme, "association work." Already from north and south, east and west, comes the inquiry, How shall we best dispose of our honey.

This has been the theme of bee talk each fall, and the burden of convention discussion ever since Langstroth, Quinby and Wagner first took prominent action in these matters.

Does it not seem strange that in the past twenty or thirty years some one individual or some party of individuals could not have solved this matter? In spite of the rapid strides that have been made in England and Canada in this regard, the beekeepers of the United States stand almost with folded arms, waiting for some one to move and then waiting to see whether he succeeds ere they lift a hand to assist him.

Some one has said considerable about jealousy, and here is one of the reefs on which beekeeping enterprises are wrecked. Let an ingenious apiarist dare to place before the beekeeping fraternity an invention, either patented or unpatented, and monopoly and individual selfishness at once pounce down upon him, point the finger back into the dim vista of the past, to some forgotten, dust-covered and often worthless model, resembling his really valuable

and practical invention, and then with thundering words of assumption, denounce him for having dared to make public his discovery.

There are those who cry down patents, presumedly (?) because they cannot control them, and then if, perchance, something does arise over which they can gain no control, they do their utmost to damage it by depreciating its value, a practice that is only equalled by the wily stranger, who forgets that your pocket-book is not his own.

If the beekeepers of America ever intend to place apiculture on a firm basis, they must individually put their shoulders to the wheel and hands to the plough, and show that they have some energy and backbone.

There is enough talk about reform in government to make this country a paradise, or in temperance, to close every dram shop ; but just call for a mustering of the troops who will stand by the banner, and then look with sorrow and regret as the talkers pass into the background, and leave but a handful of devoted followers.

This applies to every department of life, and only when an evil strikes hard at our own door, and curses our own home, becoming unbearable to the majority, any move is made.

Apiculture in this country seems to be fettered with the chains of jealousy. If one dares to make an outcry against any injustice or wrong, even his very friends shudder with apprehension, being fully aware that he will either be treated with silent scorn and cold neglect, or open abuse, and, fearing that their individual interests will be threatened, many of those who know him to be in the right, permit him to suffer injury, rather than gather about him and sustain the cause on the side of justice and right.

There must be some reason why our association work has not progressed, and why the beekeepers of this country have no effective organization.

We do not, and cannot, believe that it is on account of any lack of interest on the part of the masses of beekeepers, as we have always found them open-hearted, generous and even enthusiastic.

The trouble is now, and always has been, that those who should be the leaders *will not* act in harmony. Why this is so the former must answer.

Of what use is it to produce millions of pounds of honey if there is to be a glutted market? This is a pertinent question, and one that is often put to us. Our only answer is that when the beekeepers are ready to take the proper steps to create a demand, there will be no trouble in disposing of ten times the honey that we now produce.

Make the subject of association work the theme and burden of your talk at conventions and among your neighbors. Keep the matter alive, agitate it, and ere you are aware, grand developments will be made in our association work.

Write to Mr. Thos. G. Newman, 925 West Madison St., Chicago, Ill., and after securing constitution and by-laws of the proposed "Beekeepers Union," join it, and thus form a nucleus for effective work.

NEW OBSERVATIONS ON THE NATURAL HISTORY OF BEES.

By Francis Huber.

(Continued from p. 156, Vol. III.)

He asserts that there were no drones in the hive during the course of the experiment, but although they were absent the queen laid eggs from which worms proceeded; whence he considers that she is impregnated by herself.

Reflecting on this experiment, I did not find it sufficiently accurate. Males pass with great facility from hive to hive; and Hattorf took no precaution against any being introduced into his. He says, indeed, there was no male, but is silent respecting the means adopted to prove the fact; and although he might be satisfied of no large drone being present, still a small one might have escaped his vigilance, and fecundated the queen. With a view to clear up the doubt I resolved to repeat his experiment, in the manner described by him, and without greater care or precaution.

I put a virgin queen into a hive, from which all the males were excluded, but the bees left at perfect liberty. Several days afterwards I visited the hive, and found newly hatched worms in it. Here then was the same result as Hattorf obtained! But before deducing the same consequence, we had to ascertain beyond dispute that no male had entered the hive. Thus it was necessary to immerse the bees, and examine each separately; by which operation we actually found four small males. Therefore, to render the experiment decisive, not only was it requisite to remove all the drones, but also by some infallible method, to prevent any from being introduced, which the German naturalist had neglected.

I prepared to repair this omission by putting a virgin queen into a hive from which the whole of the males were carefully removed; and to be physically certain that none could obtain access, a glass tube was adapted at the entrance of such dimensions that the working bees could freely pass and repass, but too narrow for the smallest male. Matters continued thus for thirty days; the workers departing and returning, performed their usual labours, but the queen remained sterile. At the expiration of that time her belly was equally slender as at the moment of her origin. I repeated the experiment several times, and always with the same result.

Therefore, as a queen, rigorously separated from all commerce with the male, remains sterile, it is evident she cannot impregnate herself, and that Hattorf's opinion is ill-founded.

Hitherto, by endeavoring to confute or verify the conjectures of all the authors who had preceded me, by new experiments, I had acquired the knowledge of new facts, but these were apparently so contradictory as to render the solution of the problem still more difficult.

While examining Mr. Debraw's hypothesis I confined a queen in a hive, from which all the drones were removed; yet she was fertile. When considering the opinion of Hattorf, on the contrary, I put one of whose virginity I was perfectly satisfied in the same situation; she remained sterile.

Embarrassed by so many difficulties, I was on the point of abandoning the subject of my researches, when at length on more attentive reflection, I thought these contradictions might arise from experiments made indifferently on virgin queens, with whose history I was not acquainted from the origin, and which perhaps had been fecundated unknown to me.

[*To be continued.*]

EXPERIMENTAL BEE FARM NOTES.

With us the past month has been an unusually busy one and the call for queens in connection with subscriptions has alone even almost enough to give us but little time for rest or study which has obliged us to defer the carrying out of many of our plans and projects until the rush of the queen business is over. We have been very fortunate this season in rearing first-class queens and while we have shipped large numbers of them yet we have had but three or four complaints as regards the impurity of the queens and we have no hesitancy in stating that we never saw a better collection of breeding stock than we now have at the Apiculturist Bee Farm.

A short time since we shipped to a party in California one lot of fifty queens, twenty-five of which were young Italian queens mated with Holyland (Syrian) drones and twenty-five young Holyland (Syrian) queens mated with Italian drones. We have handled thousands of queens, and with our superintendent, Mr. Alley (who is authority on queens), we can truthfully say that we never before saw as many fine and uniformly marked queens packed and shipped in one lot.

By the time that this number of our journal reaches our subscribers every order for queens will have been filled and we shall have at least 500 queens in nuclei which will enable us to fill orders for Holyland (Syrian) and Italian queens promptly.

While many disparaging and unfavorable reports concerning the Holyland (Syrian) bees have appeared in the various bee publications, yet those who will procure one of our *home-bred* Holyland (Syrian) queens will find them all and even more than we claim for them and now is the time to give them a fair trial and thorough testing before winter comes.

About June 25th we made up a large number of nucleus colonies (standard frame). We used eight frame hives containing two frames filled with brood and six frames filled with unwired foundation. We then added to each, a young laying queen and about two quarts of bees that had just completed a lot of queen cells.

These colonies now have every comb well filled with brood and have several quarts of bees clustering on the hive fronts. With us the nucleus system of increase is far preferable to that of natural swarming.

Our apiary has been damaged more than $100.00 worth this season on account of the utmost insane desire to swarm with which our bees were possessed. During the swarming season we were very busy and had carelessly neglected to supply every colony with a drone trap; the result being that, suddenly, colonies that contained some of our choice breeding queens, and those from which we had no reason to expect that swarms would issue, sent forth their first swarms and being unprovided with traps had everything their own way for a time.

The "Whitman Fountain Pump" paid us many times its cost this season and proved a "friend in the time of need." One forenoon a swarm issued from one of our colonies and settled on one of the topmost branches of a high tree; almost immediately swarm number two poured out from another hive and mingled with swarm number one. Our friend, the fountain pump, was brought into play and the cluster was thoroughly drenched with water; but to our dismay ere the bees had become quiet, swarm number three issued from another hive and you may be assured that there was "fun ahead" for a short time. However by keeping those that had clustered thoroughly

drenched and pouring a constant stream of water into swarm number three, we at last compelled the latter to cluster within ten feet of the former and as soon as they became quiet we secured the bees in separate swarming boxes, caged the queens and cared for the bees.

We had no trouble however where the colonies were provided with drone traps. No apiarist should be without a good fountain pump and we have seen none that equals the "Whitman."

Absconding swarms can, as a rule, be compelled to alight by the discharge in their midst of a loaded gun filled with fine shot. This has often been tested by John J. Gould, of Ipswich, Mass. It might be well where a large number of colonies are kept to keep a loaded gun ready for use. Perhaps, however, some of our readers have a safer and more simple and effective method for preventing the swarms from absconding. If so we would be pleased to publish any orignal method that they may choose to send us.

We are having wonderful success with our new "combination nursery and introducing cage" (the invention of Mr. Alley).

Out of the hundreds of virgin and fertile queens that we are constantly introducing hardly one is lost. This is the only *perfect*, simple and practical introducing cage that we have ever known and every apiarist should have at least one nursery filled with these cages for use in his apiary. Its uses are many and during the swarming season every choice swarming cell can be saved and the young queens cared for until they can be used and this with but little trouble or expense.

We have in our apiary a number of queens that are well worth $50.00 each, and our superintendent says that the hatching bees in the nuclei show that we have shipped several hundred queens equally as good as those that we now have.

Some of our colonies have already stored upwards of one hundred pounds of honey this season and Mr. Alley says that during his experience of twenty-seven years in bee-keeping he has never but once before known them to do as well. Our superintendent, and indeed all those who have visited our bee farm, agree in the statement that they have never seen a larger or finer collection of queen bees than we now have on hand. This may seem to be strong language but it is a fact that we would be pleased to demonstrate to to all those who choose to favor us with a visit.

We are continually receiving testimonials even stronger than the statements that we have made and it is a pleasure to us to know that the queens and goods shipped by us are giving universal satisfaction. We propose to furnish only first-class queens and goods.

We are receiving the same questions over and over again regarding the care and introduction of fertile and virgin queens, but as brief answers are not enough, we advise all those who wish to become conversant with the rearing and care of queen bees to purchase "Alley's Handy Book," third edition, as it is "authority" on all such questions. The work is for sale at this office at $1.50 per copy.

Occasionally, a customer writes that his queen "was successfully introduced but does not lay." The fact is, the queen was not successfully introduced, but was stung when liberated from the cage.

When this is the case the queen to all appearances is all right as there are no marks of the sting. In a few days, however, she will be missing, and queen cells are started.

With the most explicit directions there are those who *will* lose queens when introducing them, and one *must* become acquainted with the habits of the bees ere he thoroughly understands why these things are so.

The essentials of the successful introduction of queens are these :—

The bees must of course be queenless ; and the bees and queen to be introduced *must* become thoroughly acquainted and scented alike ere the latter is liberated. At the time when the queen is liberated the bees must be undisturbed in order that neither the queen nor bees may become excited or frightened.

Some parties claim that even where a fertile or laying queen is to be introduced the colony should be queenless at least three days ere the new queen is given them. This, in our experience, we have proven beyond dispute is not necessary, and further we find the loss in introduction smaller where the laying queens are introduced or liberated by the bees within forty-eight hours after the old queen has been removed, than where the colony remains queenless three days.

With virgin queens, however, the three days' method is the only safe one.

About three weeks since, we sowed a piece of silver hull buckwheat and now it is in bloom which to us seems like a rapid growth. We have sown in all three acres of buckwheat for our pasturage.

We have been examining the *Clethra alnifolia* (swamp alder) which is found in abundance along the roads near the lake, and in the swamps near our apiaries, and it has proven so valuable as a honey plant, yielding such rich, beautifully colored and finely flavored honey that we propose to surround our whole estate (eight acres) with a double hedge of it, and also use it for shade in our apiary.

Towards the last of August and early in September, especially in sections where buckwheat is abundant, a few swarms may be expected to issue.

The wise apiarist will, as a rule, remove or destroy the cells and return the bees to the hive from which they came, because if the weather is not very favorable, and the fall flowers abundant, late swarming will prove the destruction of both the old and young colonies, as it is so late in the season that sufficient young bees cannot be reared to keep up the proper temperature during winter.

In some cases, and especially where one wishes to save the cells, it is well to keep the old colony queenless three days, remove the cells to the "nursery" and then introduce the old queen, or any other, as per method given elsewhere.

We have been overworked thus far this season, but we are looking forward with pleasant anticipation to the time when we shall be able to carry out the many plans that we are maturing to make this department many times more valuable and instructive both to the expert and novice than it now is.

CORRESPONDENCE.

NEW YORK AND FLORIDA.

As the earth slowly approaches the great winter, as known among astronomers, our summers continually grow shorter until a few hundred years hence, spring and fall will pass insensibly from one to the other without any summer at all. Those that become interested in the vicissitudes of the weather observe our seasons gradually changing enough to be noticeable in a very few years, as we have late springs and earlier falls, which will make it necessary for even the hardiest plants in the vegetable kingdom to grow spontaneously. Also it is materially affecting the successful survival of our pets (the bees), which in time will become extinct in the north, like the mastodon of a past tertiary pe-

riod, and the ancient dodo of cenozoic time.

The most careful management and application of modern science are necessary to carry them through from fall until warm weather and flowers again appear, as proven year after year by those who make bee-keeping an exclusive study and business. The yield of honey from maple, willows and all early blossoms was very profuse. The bees worked finely when the weather was warm, which has been seldom the case during the past month. In Herkimer county the small apiarists have been unsuccessful in wintering their bees, and what have survived will be in poor condition for the clover and linden bloom later.

Our yard, wintered in Herkimer county, commenced the month of May with just bees enough to keep brooding nicely, and as all the colonies had young, vigorous queens, they soon commenced gaining in numbers, although too reduced to gather much surplus honey. The first week of May was cold, but was followed by a warm spell of a few days; then cold and desolate the rest of the month. The reader who is interested in the Florida enterprise will note the condition of the bees of New York, and compare the result with that of those brought from Florida, and put in the same yard.

During the summer and fall of 1883–84, the idea was first presented to me to take bees to South Florida to winter, and increase them extensively, so as to have no loss in wintering, and have all strong with young vigorous bees to take advantage of our numerous spring flowers. After corresponding extensively with the permanent beekeepers of the south, information in regard to swarming in March, and the abundant bloom during the month, made it a point worthy of investigation, so, taking one colony and sailing from New York, December 1st, we confined our attention most minutely to all things pertaining to successful moveing *en route* between New York and Florida. Our investigations led us to believe that it was worthy of a trial on a larger scale.

As before stated, in Jan. No. "Api" we took sixty colonies and started Nov. 10 from New York state and arrived at Sanford in good condition.

Here is where our experiment commences. Every step to be taken was a step in the dark not knowing the extent of southern bloom in swamps, temperature, etc.

During the month of December it was hot and sultry. The bees carried pollen and juice from the orange, but not much honey. Robbing was going on every day if any honey or combs were left exposed. The queens, however, started brood in two and three combs, and everything promised finely. By looking at the temperature given heretofore, you will observe that the months of January and February were decidedly cold, averaging for the two months only 55° and 54° with a variation of 58° in seven hours. Now, my ideas of keeping bees south was to keep them cool, so I made one great mistake by leaving the top of frames exposed, with nothing but a thin cover, one inch from the frames, and the result was disastrous. While aware they were too cold, I kept neglecting it daily, expecting warm weather again, so the month of January passed and the bees had been consuming the stores given them upon their arrival and became much reduced in strength.

During February there was no improvement in temperature, and a very poor month; for, with the scarcity of bloom and dampness, none but those under favorable circumstances improved during the month. During March they improved rapidly and many that belonged in the south swarmed. But mine did not com-

mence until April to show indications of swarming, and by the first of May we had divided and had four to seven sheets of brood each. The orange bloom had passed.

Our time had come to return north. The grape was about to bloom and the palmetto was attracting the bees' attention with a fair promise of having our hives filled with loose honey. So we secured all weak combs with transfer sticks and put four sheets of brood and bees and *three* empty frames in a light shipping case with just honey enough to last the bees during the journey. Then we put four hives in a crate which made a very neat package, weighing about one hundred pounds providing the bees with abundant ventilation. Thus crated, they were more easily cared for during transit.

On May 6, 1885, we started from Sanford, Fla., *via* St. Johns river to Jacksonville, S. F. & W. R. R. to Savannah, and by the O. S. S. Co. of Savannah to New York, where we, with our bees, arrived on the 10th after a very successful journey. Our loss was three out of one hundred and twenty, which was caused by suffocation during our journey from Albany to Herkimer. The rest were just perfect, no dead bees in hives, and the hives full to overflowing with young bees, which upon being liberated upon the maple bloom immediately commenced to build great sheets of combs in the extra frames and filled the hive with honey while those that were wintered north could only secure enough to keep them from starving owing to their reduced state.

Now the question, Does it pay? Taking into consideration the time, expense, and uncertainty of such an undertaking, with the success that accompanied my experiment, I should say no. But much is to be developed in making it more interesting in a financial point of view. First, when bees are taken south it should be done that they may take advantage of the early flow of honey in October which will give them sufficient stores to last during the winter months which are December, January, and February. Second, all colonies to give the best results should have abundant food, say twenty pounds each, to consume during those months. Third, all colonies should be kept warm and cosy during this time and not disturbed any more than is strictly necessary. Bees under those conditions will be strong enough to swarm as soon as the orange commences to bloom and the wideawake southern beekeeper can rear his choice queens and get in fine shape before the dragon fly appears?

CHAS. G. FERRIS.

Columbia, N. Y., June 1, 1885.

"OX-COW" QUEEN BEES.[1]

MR. EDITOR:—I was a keeper of bees, and not without enthusiasm, for some eighteen years, from about the year 1840. I read every book on the subject that I could obtain, and most earnestly and carefully studied the ways and habits of this fascinating insect, in my dozen hives. Much less was then known than now, and the hives then used were less favorable to the investigator than those with the movable frames, now affording so satisfactory facilities to the apiarian student and manipulator. Nevertheless, something was learned by use of book and hive, and the experience of others, and I ventured, after a while, to write and deliver a lecture on the "Habits and Management of the Honey Bee." Among the places at which it was read was

[1] While visiting Mr. Oliver a short time since, he referred us to this paper on the "Ox-Cow" queen bees which we have reproduced from the A. B. J. of 1876, to show what advances have been made since the time referred to by the writer.—ED.]

the Representatives' Hall of the State House in Boston, before the Massachusetts State Agricultural Society, a portion of the lecture being devoted to the anomalous, but now universally known, fact that bees when deprived of their queen or mother-bee will, by some process or means as yet unexplained, so operate upon a worm or larva, that left untouched, would become a worker or barren female, as to render her organs of reproduction fertile, the change produced even affecting her shape and size, as well as her after habits of life.

A writer in the Maine *Farmer* made a report (though with some inaccuracies) of my remarks, calling them "new, interesting, and instructive;" but very soon afterwards the editor of a Portland, Me., paper, under date of April 11, 1842, assailed both lecture and lecturer with a savagely severe and denunciatory criticism, calling the former "a bungling piece of nonsense, of a contemptible sort, and full of absurd statements," and declaring the latter to be "wholly ignorant of the subject upon which he undertook to enlighten others." Specially severe was he upon my statement that a queen bee can be manufactured out of the worm of a working bee or neuter. "The thing is as impossible," he added, "*as it would be to make a cow out of an ox*," and "nothing can exceed the contemptible folly of book-worms in the silly stories of the ancients about making queen bees out of workers." What ancient writers treat of this subject the critic did not say. I made no reply to this onslaught preferring to be guided by Solomon's advice (Prov. xxvi: 4), and to let time determine truth.

This reminiscence came to my mind as I stood, a few days since, in the apiary of Mr. H. Alley, in Wenham, Mass., and witnessed the wonderfully skilful and truly scientific operations of this most expert bee-keeper. He makes a business of breeding queens, selling them when ready for market, and sending them in little boxes adapted to the purpose, to purchasers in all parts of the country. He and many other apiarists are actually accomplishing the thing declared to be "as impossible as to make a cow out of an ox." He has, this very centennial year, sent to customers more than 750 of these "ox-cow" queens, and will sell more before the close of the season.

As is well known, the Italian bees, imported into the United States about fifteen years since, are the favorite of very many of the present bee masters. They were not known here in my bee-keeping days (1840 to 1858), we having the English bee imported by the early colonists, a much more pugnacious insect, and said to be less accumulative of honey than the Italian, while the Italian queen is said to be more prolific of eggs, and therefore a hive of Italian is more densely peopled than a hive of English bees.

I well remember how difficult it was, in former days, for those who knew only the English bee, to understand the poet Virgil's description of the *queen*, he, however, erroneously calling it the *king*. I translate the passage from his Fourth Georgic:

Glowing with YELLOW scales and DAZZLING hue,
His body marked with GOLDEN bands we view—
If safe this King, one mind abides in all—
If lost, in discord dire and feuds they fall;
Destroy their work, waste all their gathered store,
Dissolve all bonds, nor are a nation more.
If he but live ruling the glowing hive,
All are content, the fertile race survive.
Him they admire, with joyful hum surround,
While labor thrives and honeyed sweets abound.

Now we know that the poet's *king* is a *queen*, or more truly a fertile

mother-bee, and taking the Italian bee, of which Virgil wrote 2,000 years ago, she has a *yellow* body and not a *black* one like the ordinary queen of the English and American hives. I was very much rejoiced when I first saw an Italian queen, seeing by the facilities afforded in Mr. Alley's apiary more queens in a single hour than I had seen in all my own bee-keeping experience. It was a real apiarian revelation, and I only regretted that it had not come to me at an earlier day, when fitting boys for college, I encountered this description by Virgil, then wholly obscure and inexplicable.

I do not now recall any explanation of the difficulty by any annotator of the Georgics, even Martyn, the learned Professor of Botany in the University of Cambridge (England), in his admirable translation (1740–41), being wholly silent on the subject. Now, Virgil's description is intelligible, as well as wholly accurate. HENRY K. OLIVER.[1]

Salem, Mass., June 11.

ON LOSS AND SAVING OF HONEY COMB.

ED. AM. APICULTURIST.

It is a mystery to many *why* good clean honey comb is worth from two to four dollars per pound. Now, my dear reader, let me say it is true that it takes twenty-five pounds of clean, nice honey to make a pound and a quarter of comb; likewise it takes from fifteen to twenty days, precious time, for the bees to secrete and make the above amount of comb. It is also true that a good swarm of bees will gather from five to twenty pounds of honey each day when the flowers secrete most bountifully. So you see that this will make at least a hundred pounds of a clear loss. Whereas, if we will save our best combs, we can use them by putting them in our movable frame hives and save all this loss, as well as keep our bees in a better condition ready for their winter quarters. It is not worth my while to enter into a mathematical calculation, for be you reader, who you may, I say make your own calculation, and see what you can sell a pound of wax for and subtract it from fifty pounds of honey at twenty-five cents per pound, which makes a difference of $12.25 and you have your loss told, after you have your pay for wax at twenty-five cents per pound; and yet we often find many beekeepers melting their precious combs into wax, that should be utilized in a different way, and saved for future use.

J. M. HICKS.

Battle Ground P. O., Indiana.

[1] The sad intelligence comes to us this morning, (Aug. 13) of Mr. Oliver's death.

NOTES AND QUERIES.

—A certain party seems terribly troubled now that the "lamp nursery" is doomed, because it cannot be shown that all parties who invent queen-nurseries copied their ideas from the "Jewell Davis" nursery. What a pity that they did not learn, ere this, that the "Jewell Davis" nursery was practical and useful. Another case of "dog in the manger."

—The editor of one of our bee-journals states that "Mr. Benton has had the largest experience of any breeder in shipping bees by mail, and that he is having the best success in shipping queens long distances.

The party making this assertion is well aware that Mr. Benton was never heard of as a queen breeder until within a few years, and this same editor knows that there are a large number of queen breeders in this country who have shipped quantities of queens where Mr. Benton has shipped one.

We have in our possession the cages that Mr. Benton sent to the

Northeastern Beekeepers' convention for examination, and Mr. Alley has shown us that they are almost identical with that used by him over twenty years ago, the difference being that while Mr. Benton uses sugar and honey for food, Mr. Alley used honey in a sponge. The success obtained by Mr. Benton is no more remarkable than that of Mr. Alley and many others, who have had extended experience. "Honor to whom honor is due."

— That pollen is an article of food with the worker bees, and even necessary to their welfare, seems to be a settled fact with the majority of experienced "bee doctors."

— The editor of the "Canadian Bee Journal makes rather a sweeping and unqualified statement in the late issue of his journal, and one which we fear might prove misleading to many readers. He says: "We find no more trouble in introducing virgin queens than we do in introducing fertile ones. We simply cage them on combs for about twenty-four hours, and then release them."

If said party will, during a period when there is a scarcity of honey, remove the laying queens from several full colonies, and cage upon the sides of combs virgin queens (Cyprian especially) five days old, so arranged that they will be released within twenty-four hours, he will find more trouble than he reports.

Again, if he will remove laying queens from fertilizing nuclei (when no honey is coming in, or in fact at most any period) and then attempt to introduce virgin queens five days old, he will be less confident in his assertions. It is oftentimes troublesome for the expert to introduce virgin queens, and we wonder at our friend's statements.

— For a short time we offer the following inducement to those who are willing to work for us, and those who wish to obtain with but little trouble a choice queen.

To any person who sends us a club of five new subscribers either at $1.00 each, or at any of the club offers, we will make a present of one of our choice selected queens. In order that you will understand our offer we will cite an instance.

If five of your neighbors should choose to take advantage of our offer of the "Apiculturist," for one year with a choice queen for $1.50, and you should send us their addresses and $7.50, we would make you a present of a choice queen. Any member of the club can, however, take advantage of either of the club offers that he may choose.

This is a splendid opportunity for you to try our stock of queens.

—We have been issuing 5000 copies per month since April, and we invite advertisers to give our columns a trial.

—To all persons wishing to procure a cheap but a practical bee-smoker for use where one has but a few colonies, we can heartily recommend the "Clark smoker," illustrated in our June number. It is all that can be desired for the object for which it is designed, and no one can afford to do without a smoker when one can be procured for 35 cents.

— We have just received from Mr. Corneil the specimens referred to in his article and shall make a microscopical examination of them.

We trust that each party to whom they are sent will examine them carefully, sending us for publication such reports as they may deem best, as this is an important matter and one that should be decided positively and conclusively.

Mr. Corneil will please accept thanks for the favor so kindly shown us in the course that he has taken.

—To all parties who send us $1.50 for the "Apiculturist "one year, and one of our choice golden yellow queens, we offer the following guarantee.

We agree, that if these queens do not prove pure or what we recommend them to be, we will either replace them or return 75 cts. in cash.

We are shipping just such queens, as selected queens, by every mail at $1.50 each. Subscribe *at once* for the " Apiculturist " and secure one of the finest queens that you ever saw.

Sample copies mailed to any address free.

—For the rest of the season we will send with each queen one of our new combination nursery and introducing cages together with careful directions for introducing the queens.

To any old subscriber we will send one of these choice queens for $1.00.

—Now is the best time in the year to introduce queens and get your colonies in proper condition before winter comes. Colonies that have not shown as much vigor as they ought should be requeened. Remove all old and inferior queens and replace them with young and vigorous ones.

The colony having a prolific queen will, as a rule, store from 25 to 100 pounds of surplus honey, while that with a poor queen will store but little if any. A good young queen will pay 200 per cent on her cost and it is a good investment to secure a $1.25 queen.

—The following list of county Vice-Presidents was omitted from our reports of the N. E. B. Convention :— Albany county, H. W. Garrett ; Allegany county, F. A. Bunnell ; Broome, I. L. Schofield ; Cattaraugus, M. L. Langmade ; Chautauqua, W. T. Falkner ; Cayuga, J. E. Murphy ; Chenango, L. E. St. John ; Clinton, S. O. La Bounty ; Cortland, G. F. Fuller ; Delaware, J. D. Smith ; Dutchess, J. N. Knickerbocker ; Erie, D. A. Parmeter ; Essex, H. Moses ; Franklin, L. N. Wright ; Fulton, George Vanhostrand ; Genesee, J. E. Moore ; Greene, A. L. Green ; Rockland, A. J. Chapman ; St. Lawrence, R. F. Barber ; Saratoga, E. Pierce ; Schenectady, I. G. Quinby ; Schoharie, S. Vroman ; Schuyler, H. C. Stowell ; Seneca, O. G. Smith ; Sullivan, O. F. Winter ; Tioga, L. Brown ; Tompkins, A. J. Chapman ; Ulster, John E. Van Etten : Steuben, H. Stevens ; Warren, O. F. Dean ; Washington, J. H. Martin ; Wayne, Mrs. L. C. Russell ; Herkimer, P. H. Elwood ; Jefferson, O. D. Whitcomb ; Kings, T. O. Peet ; Lewis, H. N. Waters ; Livingston, L. Densmore : Madison, F. L. Smith ; Monroe, Nelson Tenny ; Montgomery, C. C. Van Deusen ; New York, L. J. King ; Niagara, George Wright ; Oneida, W. E. Clark ; Onondaga, A. H. Marks ; Ontario, William Barriman ; Orange, A. H. Cooly ; Oswego, A. E. Sheldon ; Otsego, H. T. Smith ; Putnam, C. Gallup.

QUESTIONS AND ANSWERS.

QUESTIONS BY THE EDITOR.

1. Suppose that a party who is a novice in beekeeping has an apiary of black bees and wishes to Italianize a portion or the whole of his colonies ; what would you advise as the cheapest, safest and best method of doing this?

2. In introducing queen bees, either laying or virgin, what dangers are there and how may they be avoided?

3. Why is it that a virgin queen is not so readily accepted by the bees as is a laying one?

4. What difference, if any, is there between the queens of the different race as regards the matter of introducing them to strange colonies?

5. Is there any difference between the bees of the different races as regards their accepting any queen that may be given them?

6. If you wish to introduce queens when the bees are getting no honey, do you proceed any differently than at other times? If so, please state how.

ANSWERS BY J. E. POND, JR.

1. The cheapest, safest and best way to Italianize an apiary, by a novice, would be to purchase dollar queens from some reliable breeder, and exchange them for the blacks.

In case his apiary is so far distant from other black bees, that there is no chance for cross-mating, he can by studying "Alley's Beekeepers' Handy Book," learn to rear queens for himself.

2. The chief danger is that such queens will not be accepted, but instead thereof killed. Workers, by some mysterious intuition, know strange queens at once, and immediately on finding them in the hive, strive to murder them. It would require a large amount of space to explain how the dangers attendant upon introducing a strange queen may be avoided, and in fact as yet there has been no absolutely safe method by which such introducing can be done.

3. Any answer to this question would be wholly theoretical. Probably, however, by some peculiar intuition, a fecundated queen can be distinguished from one that is unfecundated. They will accept the fecundated queen, because they probably know that the very life of the colony depends upon her; while the unfecundated queen will be of no use for a number of days, and perhaps not at all; guesses are in order, and I shall look with interest for guesses from others.

4. I have not been able as yet to discover any difference, but my experience has only been with Italians, Syrians, Carniolans, blacks and crosses between them.

I have found at times that a queen would have been accepted with joy had she behaved herself, and I am of opinion that as much of the trouble is owing to the queen as to the workers.

5. I have found no difference in the bees so far as regards the different races, I do find though that very young bees accept a strange queen readily, while older ones require considerable coaxing before they will do so.

6. Yes, I feed liberally prior to the introduction, during the time while the introduction is taking place, and for some days after she has been probably accepted. My experience has taught me that it is not safe to open a hive for three or four days after a strange queen has been let loose among the bees, and the lesson so taught has been very strongly impressed upon me, by losing several fine queens, said losses having been caused by opening the hive immediately after the queen has been uncaged, owing as I suppose to the timidity of the queens, causing them to act as strangers when disturbed by opening the hive before they were familiarized with it.

Foxboro, Mass.

ANSWERS BY HENRY ALLEY.

1. Purchase first-class queens of some reliable dealer.

2. No danger whatever when the proper method is adopted for introducing them.

3. Did not know that bees would not accept one queen as readily as an other, when certain conditions were observed.

4 & 5. None whatever.

6. I use the same method for introducing queens at all seasons of the year. In all cases I prefer the three days plan, that is, leave the colony queenless three days before introducing the queen and success is sure to be the result.

Wenham, Mass.

QUESTIONS BY MR. R. D. AVERY.

1. Which are the best bees for working on the red clover?

2. What is the average amount of comb honey produced by an average colony (either Italian or native) of bees during an average season?

3. How many colonies of bees can one manage properly for comb honey?

ANSWERS BY EDITOR.

1. In our opinion the Holy Land (Syrian) bees.

2. This depends on a number of conditions and circumstances.

If you have a buckwheat locality you may get more honey from the native bees than from the Italians from that source, though the difference will not be very great.

The average amount of honey collected in an apiary of bees depends largely on the amount of pasturage and the skill of the apiarist. Where there is but little pasturage for the bees, the average can be increased largely by sowing Bokhara clover or setting out prickly comfrey and other honey-producing plants.

In our opinion it will pay well to provide artificial pasturage for the bees where it is lacking.

3. This also depends largely on the

skill of the apiarist and his knowledge of beekeeping. We should say from one hundred to one hundred and fifty colonies, and yet there are those who manage much larger apiaries successfully.

If during the busy season one has a boy to assist with the lighter work and to do the running about, a much larger number of colonies can be cared for than where one is obliged to do all the work alone.

One great help in this regard is to have every implement and all fixtures arranged systematically and handily; this saves much valuable time.

LETTER BOX.

Charleston, S. C., June 8, 1885.

Mr. S. M. LOCKE.

Dear Sir: I wrote you on Saturday asking if you had forgotten me, and this A. M. comes the Volume of the Apiculturist for '83–4.

It is really an addition to my Apicultural Library and the only wonder is how you can furnish it and the current year's at the low price of $1.75. Have you not over cropped yourself?

You may keep back my numbers for several months, if you will only guarantee, when they do come, that they will be as valuable as your April and May consolidated number. Mr. Cheshire's opening essay was worth all I ever paid you. I anticipate much pleasure in studying over Vols. I and II which I have not had time to do up to this moment. S. C. BOYLSTON.

Macon, Ga., June 28, 1885.

Gentlemen:

I wrote to you one week ago, and in consequence of its contents, will now state that the queen has got to work and is the handsomest bee queen I ever laid my eyes on. I am much pleased with your dealings. You will hear from me again. J. T. STROBERY.

DEAR SIR:

I write to inform you of the safe arrival by mail of the back numbers of the "Apiculturist" and also (much to my pleasure) of the beautiful looking queen which you sent.

I am much impressed with the promptness and neatness with which you fill your orders and although a beginner in the science of beekeeping I hope to patronize you to the extent of my needs. W. E. LLOYD.

Rapidan, Va.

Yours of the 1st inst. just received. Thanks very much for your kindness in answering my questions. I will send you $1.50 for renewal of American Apiculturist and queen as soon as I have time. I will also get some queens of you in August.

R. R. CUYLER.

Christiansburg, Ky., July 10, 1885.

The honey season is over here and was the poorest since 1882; the white clover bloom as plentiful and lasted as long as usual but the weather was unfavorable to the secretion of nectar. The rainfall has been unusually light, succeeded by a cool spell at least once a week during the white clover harvest. North and east winds have prevailed much of the time, and we never get much honey when the winds blow from those quarters. What honey we have secured is of excellent quality.

Bees have not been up to rousing colonies this season as they usually do. Queen-rearing on a large scale has simply been out of the question.

From about seventy-five colonies I have had but one swarm. This fact alone tells the story about our poor season. When the season is good here *swarming* is the greatest drawback.

We got about one-fourth of a full crop this season. G. W. DEMAREE.

Arlington Heights, June 18, 1885.

We have had since the tenth of May a most extraordinary season for bees. Colonies that were weak in spring have built up strong in the shortest time that I ever knew them. They are throwing off large swarms and have been for ten days, fully a month earlier than for two years. All the flora has secreted a great deal of honey thus far and clover and linden are going to blossom profusely. Bees wintered poorly in western U.S.; fully one-half died from bee cholera and starvation, but everything looks favorable for good increase and a full crop of honey.

FRANK C. BENEDICT.

Harford, Pa., June 23, 1885.

DEAR SIR: I received your book, Vols. I and II, a few days since and am well pleased with it. I think those that buy it will wish to continue their subscriptions and have them all bound. They are useful and instructive.

W. J. LOWRY, M. D.

The American Apiculturist.

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FOREIGN NOTES.

BY ARTHUR TODD.

THE British Bee Journal, owing to the death of the editor, the Rev. H. H. Peel, has sustained a severe loss, inasmuch as this gentleman was one of England's most earnest and enlightened beekeepers. Fortunately there is one man in England eminently capable to assume the responsible duties of the position tendered to him, and happily accepted. It is T. W. Cowan, Esq. The announcement of his acceptance of the part of editor to the B. B. J. is hailed with satisfaction, for in his hands the interests of beekeepers will be secured, and it is expected that the Journal, and the objects which it has been established to support, will under his direction receive a fresh impulse from his extensive and practical knowledge.

For many years, Mr. Cowan has occupied the foremost position among British beekeepers. Many years ago, great attention was drawn to his exhibit of 120 lbs. of comb honey from one stock of bees, the result having been accomplished by his plan of getting his stock strong in the spring, selecting young queens and judiciously spreading the brood, He has given great attention to the construction of the hive, and the "Cowan" hive is now well known and employed in England. It is, I understand, a modification of the "Woodbury," and "Stewarton" hives. Mr. Cowan has paid great attention to the perfection of honey extractors, making three different kinds and sizes, now well known in England under the names of the "Amateur," the "Rapid" and the "Automatic."

Mr. Cowan is an authority on bee matters, has compiled works thereon, notably: "The Beekeepers' Note Book;" "Wintering Bees;" and "The British Beekeepers' Guide Book" which latter has met with a surprising success, having passed six editions in four years, and been

translated into several foreign languages.

Mr. Cowan, having plenty of leisure, and being wealthy, has had every opportunity to study his favorite subject among the bee men of England and Europe generally; his liberal education giving him command of foreign languages, which alone is a great factor in the understanding of methods employed by beemen whose apiaries one may visit. French, Swiss, German and Italian methods, hives, etc., are all equally familiar to Mr. Cowan, and this knowledge, joined to urbanity of manners and strict impartiality, has made his services as a judge sought after for all the principal shows in England.

Knowing all I do, for many years past, of the gentleman, I feel sure the B. B. J. will gain much by having such an editor, and be more than ever appreciated by its subscribers. I heartily wish Mr. Cowan a long career of usefulness.

The necessity, when sending bees by rail, to see them very carefully and securely packed, has lately been strongly enforced by a case occurring recently in the north of England. At a junction, a hive of bees had to be lifted from one train to another, and the cover or bottom, not being secure, fell off. The bees escaping, caused a scene, it is stated, that just baffled description, and that any beekeeper can imagine. The iron horses did not seem to mind it, but their drivers did, and got themselves and passengers out of that station as fast as possible.

Recently, I had some old box hives sent to me by rail, packed by a farmer, and it is a miracle that they ever arrived at all. Now I mention this occurrence, to warn our readers to pack carefully, for if some great accident were to take place, we might wake up some day to find the railroad companies putting some vexatious restrictions on the transit of packages of live bees.

Frank R. Cheshire, well known for his researches on "Foul Brood," is about to give to the bee world a new work, entitled, "Bees and Beekeeping; scientific and practical," on which he has been engaged for many years. I cannot do better than copy the words of the notice of the appearance of this work from the B. B. J.

"The author, Mr. Frank R. Cheshire, F.L.S., F.R.M.S., is well known in this country, on the continent, and in America, where he is uniformly acknowledged to be the most scientific beekeeper in England. His numerous writings have been for many years before the public, and his inventiveness has *set an indelible mark* upon the apiculture of the day.

At the first bee show, properly so called, held in this country, he secured the whole of the eight prizes offered for new inventions calculated to advance apiculture, and this fact alone is the most ample guarantee that the *practical part of the work will be as perfect as the scientific.*

His thorough knowledge of the literature of the subject has made him acquainted with all that has been done before, both abroad and at home, and has enabled him to ac-

curately judge of the importance of his discoveries, as well as to *explode many erroneous theories* which have hitherto been accepted. His investigations into the relations of insects to flowering plants, and his close study of the anatomy and physiology of the hive bee, have revealed many little suspected facts of the *utmost importance,* whilst his long courses of lectures on apiculture, scientific and practical, given in the lecture theatre of the South Kensington Museum, and the Gardens of the Royal Horticultural Society, and illustrated not only by his splendid hand-painted diagrams, but by a small apiary established in the grounds of the Natural History Museum for the purpose, have eminently fitted him for *imparting his information in the clearest manner.*

No stronger testimony to the high esteem in which Mr. Cheshire is held in scientific circles can possibly be given than the reception accorded to his investigation into the structure of the sex organs of bees, the method of controlled fertilization exercised by the queen, and the glandular structures, stated by Professor Stewart to be the *most interesting of any communication* made to the Royal Microscopical Society for several years. His discoveries of the nature and scope of foul brood, and the introduction of a method of cure, are a boon to beekeepers, and afford a further proof, if one were necessary, that the *practical management of bees* has received as close attention from him as the more interesting but less remunerative scientific questions.

"Bees and beekeeping, scientific and practical: a complete treatise on the Anatomy, Physiology and Profitable Management of the Hive Bee," is the full title of the book. The illustrations of the anatomy of the bee, bee appliances, etc., expressly drawn for this work by the author, are numerous, and of an excellence, both as regards accuracy and delicate finish, that has never yet been equalled.

At a convention of beekeepers, held in Switzerland, some time back, it was mentioned, as an observation by several good bee men, that the Carniolan queen cells have a greater diameter, and are longer than the queen cells of the common black bee, and that it had been found necessary to keep the frames of comb wider apart than is usual with the common bee. For the Carniolans a full 38 millimetres was found necessary, while 34½ to 36, sufficed for the common bees. The 38 mm. is about 1½ inch from centre to centre of frame.

Mr. Bertrand, the editor of the Swiss "Bulletin d' Apiculture," observed that the 38 mm. must not be exceeded, nor must less than 34½ mm. be employed, inasmuch as combs built very close together, and used for brood rearing, are worth less than the others because, by reason of their shallowness, they are for a shorter period suitable for brood rearing, on account of the gradual shortening of the depth of the cell as each successive generation of bees leaves its cocoon behind it.

I believe a microscopist counted

as many as nine hundred cocoons, one within another in one cell, and it is perfectly reasonable to doubt if a bee raised in such a contracted chamber can be as perfectly developed as it would be raised in combs comparatively or entirely free from cocoons.

"Foul brood" has been observed in a Swiss valley to have almost cleaned the bees out of existence where numberless stocks were formerly kept. A bee man states, "It cannot be caused by the use of modern hives, as popularly believed, for there never was one in that valley." One Swiss beekeeper relates that he had some fifty fine stocks, when in the spring a neighbor started up a lime kiln. The vapors coming off from the burning limestone brought on a perishing of the brood in his hives, and he lost every one. Since then he has found it impossible to reëstablish his apiaries. Each attempt has failed.

From Bordeaux (France), Mr. Durand writes that he has got rid of foul brood by an energetic use of the Hilbert salicylic acid treatment. Since then the disease has broken out in neighboring beehives, and he has been called in to cure.

He tried camphor, and fumigating with thyme; the brood ceased to rot, and dried up. He puts a bag with camphor in it on top of brood frames.

He likewise tried Cheshire's "absolute phenol" and fed the medicated syrup at night; but bees from another infected colony commenced to rob that colony next morning, and, proving strongest, carried away all the medicated syrup, and in so doing, dosed themselves, and, as it proved, effected a cure at the expense of the loss of the colony they started out to rob.

The Germans are ahead on the question of adulteration of honey with glucose, and method of detecting the same. Mr. Fritz Elsner instituted a series of experiments, and has proven that with the aid of the polariscope a *very, very* small quantity of manufactured glucose mixed with honey can be immediately noticed. I purpose giving an entire translation of the article in next issue of Foreign Notes, as I deem it a subject worthy of notice by all of us who have to compete with the so-called, and labelled, "Pure Honey."

Philadelphia, Pa.

ADVANCED BEE-CULTURE.

By L. C. Root.

Beekeepers in most sections have been much discouraged over what seemed a very unfavorable prospect of securing much surplus honey.

Up to the middle of July, bees seemed to spend all their time and energies in swarming.

All sources of honey seemed to fail us, except to supply just enough to induce breeding, and create a desire to swarm.

At this date the basswood commenced to bloom and, as I had predicted, it has yielded richly from the very start.

There is a lesson in this kind of a season that should not be lost.

It has afforded every possible advantage for securing large quantities of brood, and making all stocks *extremely* populous.

When stocks are in this condition, a large amount of surplus may be secured, even if the season is short. The motto in this, as in all other things where success is attained, is "Faithfulness to the end."

As every loyal heart has been made sad in the death of him whom all delighted to honor, so should we rejoice that he taught us that success can only come by honestly "fighting it out on this line," which must always be a line of honesty and faithfulness.

The few lines I am able to send you I am pencilling on a pad in the midst of my busy family.

I have never seen honey stored more rapidly than it is being at present. I am running forty-eight stocks in my home apiary for extracted honey. We extracted all of the honey from these stocks on the 15th of July. On the 27th, we extracted from these hives 3,715 lbs., all having been gathered in twelve days.

The next day, July 28th, we had with us Pedro Casanora, the pioneer beekeeper of Cuba, who accompanied us to our apiary, six miles distant, where there were forty stocks. We had extracted all the honey from these hives just seven days previously.

This day's work proved one of the most astonishing of our experience; we secured 4,103 lbs. of honey.

This proves something of the possibilities of advanced bee-culture under favorable conditions.

Mohawk, N. Y.

BLACK BEES MORE DISPOSED TO ROB, AND MORE LIABLE TO BE ROBBED THAN ITALIANS.

By L. L. Langstroth.

When the Italian bees came to this country they brought with them this character, from the Baron of Berlepsch: "they are more disposed to rob than common bees, and more courageous and active in self-defence." Experience soon convinced me that while Berlepsch was right in the second of these two assertions, he was entirely in error as to the first. Let me give some facts.

On one occasion I was examining a colony of bees, when a visitor was announced. Intending to return in a few moments, I left the hive open while several combs were resting against it on the outside. I forgot all about this hive until my visitor asked if there was not robbing going on in my apiary. We went at once to the neglected hive which was now surrounded by thousands of robbers. The bees on the combs which were outside were vainly striving to protect them, while the robbers were literally swarming upon them and forcing their way into the exposed hive. Many were killed; but we all know that under such circumstances this makes no difference. Putting back the exposed combs, thereby shaking off the bees,

and replacing the cover of the hive, but leaving the whole front entrance open, we watched the result. In a few moments the bees have their line of battle spread over all the alighting board extending down from the floor of the portico quite to the ground. The dying and the dead are dragged out in large numbers. Every robber that dares to alight where this line of embattled Italians is formed is attacked, and if he cannot pull away is quickly killed. The robbers soon understand the changed condition of affairs and in less than half an hour the attack is over.

Under such circumstances I never contract the entrance. It annoys the bees by making their hive too hot, and with Italian bees is a useless precaution. When such robbing as I have described sets in, it is amusing to see the robbers, when fairly beaten off, spread themselves everywhere over the apiary. Wherever they have tasted a drop of honey that they have not gathered from the fields, there they are hoping to find more, and if there is a stock or nucleus from which they have stolen anything, they are there too. In short, every colony large or small is put to the proof and their ability to defend their stores fully tested, but it is almost impossible to rob, when it is in good heart even a small nucleus of Italian bees.

Need I say to those who have had much experience with black bees, what would have been the fate of this colony if it had been of that race, or how much a whole apiary of such bees would have been demoralized by such an occurrence?

Let me now relate something which took place about two weeks ago. In examining a very strong stock which had only a slight touch of Italian blood, robbers soon made their appearance and the hive was closed before the queen could be removed. I say closed, but the upper cover had not been properly adjusted; there was quite a corner left open. Attracted by the roar of bees, I found that this large colony was being robbed. The cowardly black blood had not proved equal to the emergency. When the cover was shut tight, there was no line of battle formed, resistance had ceased, and it was necessary to close the entrance, cover the whole hive with wet cloths, etc., in order to save it. Of course the robbers fell upon the other hives, several of which were quite weak. Some of these were pure Italians and the others had enough of that blood to make such a fierce resistance that the robbers were soon beaten off. They had tasted stolen sweets, they were crazy with excitement, and yet they could not rob another hive!

If only a few of these stocks are in or near to a large apiary of Italian bees, you will ever find them on hand when there is any chance of stealing and at times when scarcely an Italian gives you any annoyance.

I do not deny that there are a few points in which black bees have superior merits, but their eagerness to rob when forage is even a little scarce, and their deficiency in pluck, by

which they are so often ruined where the yellow races would not be severely injured are, with me, sufficient reasons for discarding them.

Oxford, O., August, 1885.

BEE CULTURE IN THE SOUTH.

By G. W. Demaree.

If the honey season was as poor all over the country as it has been here, there would be no need of those philanthropic articles which have appeared in the bee papers from time to time, warning people not to board the bee schooner lest she go down with the whole crew. Those persons who have been "fired" with bee enthusiasm by reason of the past good honey seasons, after seeing this season through, will need no soft emulsions to soothe nor application of ice to cool down their raging "bee fever."

DIARRHŒA AND POLLEN

Is a subject that is having a sad effect on some of the brethren.

"Pollen is the cause" (?) but the theorists cannot tell us why the diseased bees are loaded with watery excrementa. If pollen loads the bees and induces inflammation and disease, whence comes the large preponderance of watery substance? Dr. Tinker has been making pertinent inquiry in this direction of late, and there will have to be more theorizing. Mr. Doolittle reported two cases of diarrhœa when no pollen was present in the hives, but the microscope was resorted to, to save (?) the pollen theory. So deadly is pollen in its effects on the brethren's bees that the microscope is brought out, as in the case of suspected poison in the stomach of man or beast.

Then there is this difficulty in the way of the pollen theory, to wit: bees do not suffer with diarrhœa in a moderate climate. My location is not far from the dividing line between diarrhœa and no diarrhœa. Nevertheless, I am on the side of no diarrhœa.

With some knowledge of bees for forty years I have never seen a *fatal* case of diarrhœa, *i. e.*, the combs daubed and the bees soiled, resulting in death. Every hard winter, however, shows the trouble in its incipiency. Some colonies show a large per cent of bloated bees, but the trouble is more dropsical than fecal in character, and this fact alone is fatal to the pollen theory; because it shows that accumulation of watery substance produces the distended condition as perfectly as does the accumulation of the substances excremental in character. I believe that those conditions surrounding bees which prevent healthful exhalation from their bodies are the true causes of bee diarrhœa and pollen is not even one of the causes. I have no reasons to change my former convictions that the cause is climatic.

I have said that I never saw a fatal case of bee diarrhœa. Well, I intend to produce a case or two, or make a discovery that will be worth a great deal to me in the future. I shall winter several colonies on the cheapest brown sugar I can find, and at least two colonies on sorghum syrup; I shall exclude all pollen. If they

winter well on food (no pollen) at four cents per pound, why should I waste pure honey at twelve and one-half cents per pound? You see we are told with great authority that nothing but pollen will hurt bees, not even "fizz" will hurt them.

THE BEST BEES.

I have taken great interest in this subject. My articles, published in a number of the bee periodicals, will show that I, like the editor of the "Api," have pointed out the fact that the Italian bee is a hybrid. Really, I believe that I was first to publish convictions of this fact. Still the Italian is a hybrid of respectable age, perhaps two or three thousand years old. Well, now, if these aged hybrids still "sport" when breeding, as every experienced breeder knows they do, what do you think of the "fixedness" of the "strains" of hybrids of less than a half score years old.

When we breed the Italian from selected specimens we only breed back towards the original stock on the side of the yellow parent. Of course we may make mistakes by failing to choose breeders from the strongest and best working stock.

From long and careful observation I am inclined to think that, originally, there were but the two great families of the honey bee, the yellow and the black. What we see in the ants, wasps, etc., warrants this conclusion to say nothing of the disposition of most types or races of bees to "sport" when breeding them. I advanced this theory some years ago as may be seen by referring to the "files" of the *American Bee Journal.* If I am correct in this, the inter-breeding of the yellow strains, with their varying purity, viz., Italian, Cyprian and Syrian, is the correct way to obtain the best bees of the yellow race.

Christiansburg, Ky.

THE NEW vs THE OLD.

BY T. A. P.

No branch of apiculture has made more rapid strides in improvement than the shipping and introducing of queen bees. It would seem that we have almost reached the acme of success. The fact of sending a live queen bee by mail to any part of the United States is even now looked upon with wonder by the uninitiated; but to us of the bee fraternity it is no new thing, except it may be to receive from or send them to foreign countries, which no doubt is about being accomplished, owing to the invention of a food that obviates the necessity of water accompanying the queen. It is only a few years ago that, to ship queen bees from Europe, it was necessary to accompany each queen with a small swarm of bees put in a miniature hive which held some small combs of honey; resulting often when arriving here in a mass of dead bees and honey, and that too after undergoing the expense and annoyance of red tape in the custom house. The thing can be done now in a small shipping and introducing cage which can be thrown right into the mail bag, and, thanks to the fast sailing steamers of our day, sent with lightning speed around the world.

To ship a queen short distances

has always been comparatively easy, but a journey that would take a week or ten days was a very doubtful matter and with valuable queens could not be risked by any except those who could afford to take the risk; but now owing to the "*Good*" *candy* and fast travel, there need be no risk at all, and then if a party did receive the queen all right, the introducing of her was a feat not so easily accomplished as the reading of the theory would indicate. In the first place she must be transferred into another cage to be introduced and often was hurt beyond redemption between the fingers of the trembling hand of a nervous beekeeper. Not so now. The "Peet" cage was the first to revolutionize that part of the work and now the "Alley cage" simplifies it still more and we can truthfully say, the beekeeper "though a fool need not err therein;" and the saving of time by withdrawing the old and introducing the new queen at the same opening of the hive is a point of value highly appreciated by every beekeeper, who has had any experience in the old method. Truly we live in a wonderful age, everything is fast. The electrical current seems to permeate this part of the world completely; distance and time are annihilated; on land and sea we have our Maud S's fighting time and distance; we talk with each other hundreds of miles apart as though we stood face to face; we ride on elevated railroads and across bridges that span the streams of waters as though suspended from the very heavens, and are lighted on our way by a similar current captured as it were from the very lightning itself and chained to every pole.

That the "Api" may prosper and, like a true child of the times, grow apace with the "New *vs* the Old" is the sincere wish of the writer.[1]

EDITORIAL.

We must of necessity be brief this month, and the thought which we would present to our readers is one that we have often urged before, but never more opportunely than now,—that of association work.

With the month of September comes the calling of our conventions, the beginning of our apicultural year so to speak. It is not the time to boast when the harness is being put on; and it is not in the way of boasting, but by way of summons, that we say there never has been a year that began with better promise, and from which we had reason to expect greater results, than the one now dawning upon us. The tone of feeling manifested by our earnest and active apiarists in the work of the future is unmistakably encouraging; the system of organization among us has never been so complete; and the opportunities are overwhelming.

We cannot but feel ourselves justified in contemplating plans for enlarged activity, and we only voice, we believe, the sentiment of the beekeeping fraternity everywhere, when we bid welcome to the opportunities and responsibilities before us, in pledging ourselves to energy and

[1] The initials at beginning of this article *should* read "T. O. P."

faithfulness, and in asking that our endeavors be crowned with a rich and abundant fruitage.

We would therefore especially direct the attention of our readers to the notices of such meetings that have been forwarded us, and trust that they will be more than ever impressed with the importance of these organizations and the help they afford to the individual beekeeper.

To this end, we can but repeat the advice given in our Editorial of last month to "make the subject of association work the theme and burden of your talk at conventions." The two are so intimately blended, so closely interdependent, that we feel in recognizing the necessity of the one, the importance of the other is already acknowledged.

Association—the very name is pregnant with meaning. Implying, as it does, a *coming together*, for work or for counsel, we must feel that it contains the elements, which, if rightly employed, will contribute greatly to our advancement. Our only misfortune is that either we have no faith at all in this cardinal fact, or our faith is so weak as to be practically inert and inoperative.

Let us then awake to duty, and show by our presence at the conventions, that we are ready for work.

One organization cannot act here, and another there, without any co-operation, with any efficiency. To do our work well, there must be united action. Money would be wasted, labor would be lost without it. We shall be false to ourselves and to our fellow beekeepers unless we arise to a just conception of our great work, and gird ourselves to perform it with the strong armor of justice and right. It seems as if very little argument, if any, were needed to convince us all that we cannot do the work we are called upon to do without cordial, active, earnest co-operation. The interchange of thought and opinion which we here obtain, is of vastly more value to us than we are willing to admit. This may seem to be a very trifling thing. But just as the massive oak springs from the insignificant acorn, so we find the insignificant in life; but it is there for the sake of the infinite. Grasp then, its possibilities, and so respond that all hearts shall be glad, and a new era be inaugurated in our labors to advance the cause which we represent.

Apprehending this fact, you will see the importance of bringing thither your best thoughts, a thorough knowledge of general principles, or a ready activity to learn of those already versed therein, and a lofty courage to grapple with whatever difficulties may be in the way.

The time is coming, and is not far distant, when the science of apiculture shall assume a higher position than it has yet occupied. Freed entirely from conventional restraints on the one hand, which have limited its range of thought and observation, and from petty jealousy and suspicion on the other, lest it should be straying beyond its sphere, it will speak not in the uncertain language of theory, nor with the wayward tones of private speculation; but with an impetus gained from present experience it will gather its treasures

from the rich mines of thought and spread them broadcast over the world.

Thus armed, our meetings can but tend to a profitable issue, and we shall come away with the feeling that we have fulfilled our part of the mission these organizations were instituted to accomplish.

It is hardly necessary, perhaps, to call your attention to the prospective National Beekeepers' Union; for if we may trust the present indications, the appointment of delegates is likely to be general. And yet the importance of such a Union is so great, that no opportunity should be lost, of making our several organizations realize, beforehand, the duty of being represented in that body by the very best and ablest of our beekeepers.

Mr. Pond in the *Am. Bee Journal* of Aug. 26, in an article entitled, "Is the "Union" of value or not?" says:

"I do not understand the apathy that seems to exist among our beekeepers in regard to our Union for defence; nor can I understand why every beekeeper in the country does not respond at once to the call, and enroll himself on the list of papers thereof. There is no question but that the "Union" is of importance to the fraternity as a whole, although, perhaps, there may be cases (like my own for instance) where no particular individual benefit will result from it. We, however, as a class should drop selfishness, and instead of saying *cui bono* as to ourselves, should ask simply, will the "Union" be of any advantage to the fraternity as a whole?

If a large majority of the beekeepers in the country respond to the call, it will show the public that we are alive to our interests, and intend to defend them to the bitter end, and the result will be that by presenting a bold and determined front, we shall assure any possible antagonists that we are not to be assailed with impunity by any one who fancies he is aggrieved. On the other hand, if only a few of us respond in this matter, it will tend to show that either we take little interest in this matter of protecting our rights, or else that we believe ourselves in the wrong, and consequently prefer to save our dollars rather than invest them where we shall lose.

Let me urge one and all to enlist in this cause; do not delay a moment, but at once send in your names; and what is of more consequence still, your money, and thus show the public that you do not propose to be intimidated or to allow any one to drive you from the field without first making a strong and bitter fight to accomplish it."

We are sure that the topics presented for discussion will suggest possibilities of effort in behalf of the cause to which we are espoused as will enlist the enthusiasm and the earnest coöperation of every ardent lover of bees. It is idle to say that we shall know just as much if we stay at home and read the results in the bee journals. We need to look each other in the face in the presence of the thought of the great duties and opportunities which are before us and, by discussion of them, at once mature wise methods of action and rouse each other to a spirit of consecration to our work.

NEW OBSERVATIONS ON THE NATURAL HISTORY OF BEES.

By Francis Huber.

(Continued from p. 181, Vol. III.)

Impressed with this idea, I undertook a new method of observation, not on queens fortuitously taken from the hive but on females decidedly in a virgin state, and whose history was known to me from the instant of their leaving the cell. From a very great number of hives, I removed all the reigning females and substituted for each a queen taken at the moment of her birth.

The hives were then divided into two classes. All the males, both large and small, were taken from the first, and I adapted a glass tube at the entrance so narrow that no drone could pass, but large enough for the free passage of the common bees. In the hives of the second class I left the whole of the drones belonging to them, and even introduced more; and to prevent them from escaping, a glass tube, also too narrow for the males, was adapted to their entrance.

For more than a month, I carefully watched this experiment, made on a large scale, but much to my surprise, every queen remained sterile. Thus it was proved that queens confined in a hive would continue barren though amidst a seraglio of males. This result induced me to suspect that the females could not be fecundated in the interior of the hives, and that it was necessary for them to leave it for receiving the approaches of the male. To ascertain the fact was easy by a direct experiment; and as the point is important I shall relate in detail what was done by my secretary, and myself on the 29th of June 1788.

Aware that in summer the males usually leave the hive in the warmest part of the day it was natural for me to conclude that if the queens were obliged to go out for fecundation, instinct would induce them to do so at the same time as the others. At eleven in the forenoon, we placed ourselves opposite a hive containing an unimpregnated queen five days old. The sun had shone from his rising: the air was very warm; and the males began to leave the hives. We then enlarged the entrance of that selected for observation, and paid great attention to the bees entering and departing. The males appeared and immediately took flight.

Soon afterwards, the young queen came to the entrance; at first she did not fly, but during a little time traversed the board, brushing her belly with her hind legs; neither workers nor males bestowing any notice on her. At last she took flight. When several feet from the hive, she returned, and approached it, as if to examine the place of her departure, perhaps judging this precaution necessary to recognize it; she then flew away, describing horizontal circles twelve or fifteen feet above the earth. We contracted the entrance of the hive that she might not return unobserved and placed ourselves in the centre of the circles described in her flight, the more easily to follow her and witness all her motions. But she did not remain long in a situation favorable for our observations, and rapidly rose out of sight. We resumed our place before the hive; and in seven minutes the young queen returned to the entrance of a habitation which she had left for the first time.

Having found no external evidence of fecundation, we allowed her to enter. In a quarter of an hour she re-appeared; and after brushing herself as before, took flight. Then returning to examine the hive, she rose so high that we soon lost sight of her.

[*To be continued.*]

CORRESPONDENCE.

THE HONEY MARKET.

MESSRS. EDITORS:

In the August number of the *Beekeepers' Magazine* is an article entitled "The Honey Market," in which the author alludes to our firm in rather disparaging terms. Said article charges us with misrepresentation in order to induce producers to ship us their honey, which charge we most emphatically deny, and which seems to us to have originated solely in the fertile imagination of the writer, without facts to sustain his assertion. A few facts, however, may act as a solace to his affected brain.

We have, at the solicitation of publishers of numerous magazines, given quotations the year round, as we have a market for honey every day in the year, Sundays and holidays excepted; and when the author asserts that there has been *absolutely* no demand for honey since May 1, he says that which is not true, as there has not been a week nor a day since May 1st to present date that we have not sold more or less honey. We sold out our entire stock of white comb honey about the 1st of April, and since that time have had to go on the market here and purchase of other dealers to supply our trade, a fact to which some dealers in our city will testify. We had a lot of thirty-eight barrels of honey turned over to us June 12, which had lain on the market over six months, which we disposed of and sent the owners a check June 29. Since May 1, we have had a better trade in honey than we ever had at this season of the year. We have received a few small lots of this year's crop comb honey, which has sold readily at our quotations, and returns have been made to shippers. We have recently received numerous letters from producers, inquiring as to the state of the honey market, prices, etc., to which we have replied in nearly every instance that it is too early in the season to give quotations on the coming crop, and too early to commence shipping comb honey. We mention these items not as an advertisement, but to prove to the author of said article, that he has done us an injustice and should make due reparation.

We have always endeavored to hold prices up rather than to depress them, as our experience teaches us it is easier to lower prices than to raise them, while it seems to us our friend seeks to keep them down rather than to elevate them.

McCAUL & HILDRETH BROS.
New York.

A VISIT TO THE BEE FARM AND OTHER MATTERS.

FRIEND LOCKE:

About two weeks have now passed since my pleasant and profitable visit to your bee farm to which I shall always look back with pleasure. I hope soon to hear that your factory is in active operation, and that you are on the road to prosperity with your pets, the busy bees.

I received the "Apiculturist" a short time since (July 29) and deem that number worth more than one year's on account of the information contained therein. What beekeepers want are the minute details to aid them in caring for their bees, and it is essential that these instructions be given in the most plain and simple manner possible, so that they can be easily understood.

What beekeeper can afford to be without this journal if he wishes to be successful?

My Cyprian bees led out a swarm on July 28, and returned to their hive again. I could not get them to work properly. Swarm they must and swarm they did. I divided them, gave them one good queen cell and

cut out the rest, and on the next morning they were at work as though that hive had always been their home.

I removed a number of pounds of honey the other day; it was very fine linden honey. There were a large number of sections not yet completed.

I like my hives better than any others that I have ever seen, even though they cost a trifle more than cheap ones. They are, however, substantially constructed and will last a lifetime, are easy to manipulate and to pack for winter.

The linden bloom is now over for this season. Clover is blooming, and I hope to get a fine crop of honey from it, and the golden rod looks well.

We have had plenty of rain, and all nature has been benefited by it; the fields and pastures look green, and the honey-producing flora seems abundant.

There are no lazy bees in my apiary. The queen received from you has grown to be very large and has filled her hive with young bees. I looked her up the other day, and was surprised, as it was quite a task to find her because the bees were so numerous (she is a "big" one), her progeny are well marked, orange-colored and of good size. I think of rearing some queens from her to put in some of my other hives, as her bees work so well.

Well, now, Mr. Locke, if I were as young as you are, I should start a bee farm, as I believe that it would prove a success. You have everything in your favor: good health, and a great love for the business, which at the start would insure success. I trust that you will always prosper in your undertaking. I should be pleased to have you come to Taunton and return my visit, when I will introduce you to a number of my beekeeping friends, who will take an interest in the work that you are doing when they see that you are working for their good and in their interests.

Alley's "drone traps," received from you are a success, let others say what they may. I have nothing at stake, hence can afford to tell the truth. I have no drones in my apiary but Italians, thanks to the drone trap.

I want to make a good exhibition at our county fair this season, and trust that you will aid me all that you can in so doing. I have had the premium on honey raised from $10.00 to $25.00, so as to have a good show. We must all work hard to do our part in introducing our honey, and working up a demand for the same.

JAMES H. BOSWORTH.

Taunton, Aug. 3, 1885.

NOTES FROM "DUN GLEN APIARY."

MY DEAR "API:"

Last night closed our (Ross) Co. fair. We had a remarkably good attendance considering the hard times, and the failure of our wheat crop this year. It is the first year in which any display of bees and apicultural fixtures has taken place. I had on exhibit an observatory hive with bees, brood, etc.; the hive and fixtures I use in my apiary; a queen nursery on Alley's plan which I have used very successfully this year (and I do heartily recommend his "Handy Book"); a fertilizing hive, some queen cages, etc. C. M. Roberts exhibited Root's foundation machine; some foundation worked out by the bees with his name in large letters plainly visible at the fish bone! some extracted, and some comb honey. E. Magenhoffen had an extractor (Muth's), and David Brown, of our county, had an observatory hive with a frame of Holylands and some queens in cages. A good deal of interest was manifested by visitors in our display. We hope to be able to improve very much on it

next year, and to induce our managers to offer something in the way of premiums on articles, thereby working up more interest and a spirit of competition. I am highly delighted with volumes 1 and 2 bound in one, of the "Apiculturist," as I also am with the current volume. The "Api" is certainly advancing things in Bee-ology.

P. S. Our honey season has been a failure, white clover all frozen out. Italians worked on red clover and gathered some surplus, blacks none. David Brown, who has Holylands (Syrian, I suppose, as he got his queen from Alley), reports some honey, plenty of brood, and a good prospect for wintering. Bees generally wintered badly; I lost heavily. Sweet clover is abundant along the water courses and railroads, but the farmers are uneasy at seeing it making its appearance on the roads fearing its encroachment on their farms and that it will be hard to get rid of.

FRANCIS W. BLACKFORD.

Chillicothe, O.

HOW CAN A VIRGIN QUEEN BE SAFELY INTRODUCED?

EDS. AM. APICULTURIST:

We have been engaged in bee-keeping more than forty years, and have often hatched some very fine queens, from stocks possessing such desirable traits of character as to warrant us in the effort of having all our stocks of bees composed of the same, if it were possible; but, after hatching many fine queens from the eggs of a chosen stock as above, I have also made special effort to have some of the young queens properly introduced into other queenless stocks, made so for the purpose, but in nearly every instance the queens were killed, and the reader can best judge how I felt under such circumstances. I have always found queens that were hatched in strong and vigorous stocks, to be much the best; hence, it will be readily seen that all stocks to which I attempted to introduce virgin queens were strong and full, having been robbed of their queen but a short time. In some instances a day or two, and sometimes only two to six hours they were left queenless, before I attempted the introduction of the virgin queens, all of which were hatched in a queen nursery, placed in strong stocks. Now be it remembered that, to my certain knowledge, I have never had but one virgin queen accepted and become fertilized when I have attempted to introduce as above, and this one case was accomplished in one of my Ohio apiaries, in 1883, which I do not really look upon as a success, from the simple fact that she was superseded in less than sixty days. Hence we are of the same opinion now as we were thirty years ago, that all forced queens, as well as those reared in nucleus hives, are short-lived as well as worthless. We ask who can fully explain why it is that virgin queens cannot be safely and surely introduced. Try it who will, and we will guess a failure eighty-five times in one hundred trials. What say you, brothers Locke, Alley, Heddon, Cook and other apicultural teachers? Please answer and oblige your readers.

J. M. HICKS.

Battle Ground, Ind.

THE COMING FRAME.

ED. AM. APICULTURIST.

In Cook's Manual, page 131, among others, Dr. Tinker is quoted as using the Gallup frame. It appears from the doctor's circulars that he has now abandoned this size and adopted one $14\frac{3}{8}$ by $9\frac{1}{2}$ inches as his standard. Up to this I had imagined the "Gallup frame" to be all that could be desired; but, as the

Doctor is an experienced apiarist, before abandoning the Gallup he must have discovered some flaw in it which I fail to discover. I would therefore beg ask him to give us through the columns of the "Apiculturist" his reasons for making the change and state also if he finds any special advantages in his new size that would warrant its adoption as the "coming frame."

APIS CANADENSIS.

JOTTINGS FROM ENTERPRISE APIARY.

MESSRS. EDITORS:

Among my bee papers and books, I find but little said about the use of "queen cells," as an aid in controlling a colony of bees. Not doubting that the older, or if you please, the "X Y Z" class know all about it, I give my experience for the benefit of the "A B C" class. Some years ago, when I commenced keeping bees, I stayed home from church for five or six Sundays each season to watch my bees, but not feeling it to be right to do this, I tried all non-swarming plans I could hear of, artificial swarming, etc., etc., but none seemed to give as good results as natural swarming. How was I going to have natural swarming, and yet not have it occur on Sunday? Five years (or nearly) ago, I found an answer to the question in the proper use of queen cells. During the swarming season, I start cells from my breeding queens twice each week, always dating them. These cells are designed for my nuclei, but may be used to control swarming as might any other cell after it was capped, but I prefer to know when it will hatch and from what stock it was reared.

In looking my bees over on Monday, every stock that I think will be apt to get in condition to swarm on Sunday following, I mark the hive on closing it, by laying a stone on it. On Thursday, I insert a capped cell into each one of these stocks, just letting it rest lightly between the top bars of a couple of frames. There is no necessity for taking out any frames or anything of the kind, just get the cell in the hive, right end up without bruising, and the next day, if fine, look out for a swarm; if cloudy or cold, the swarm will not come out until Saturday or the second day.

This cell answers another purpose also.

Hatching, as it should, not more than two or three days after swarming, before there is sufficient young bees hatched to cast a second swarm, the remainder of the cells will be destroyed; you have a fine, young, Italian queen from your best stock, and in my experience all after-swarming effectually stopped, not having had one in the last four years. Of course, to do this and succeed every time, one must have a fair knowledge of the habits of bees.

Bees have increased wonderfully this season. Last spring, I set aside five colonies for increase, and by the use of empty combs, I have reached twenty-five now all ready for winter, except two. I have fed them nothing, and let them rear their own queens.

No dark honey as yet has been secured. The yield of white honey with specialists, is about 100 lbs. per colony, spring count.

P. S. Impress on your readers that "late and heavy working" of bees is the prime cause of loss in wintering.

C. M. GOODSPEED.

Thorn Hill, N. Y.

NEWS FROM CALIFORNIA.

EDS. APICULTURIST:

The spirit moves me to write you a letter, not that I expect you to print it, for I never could properly prepare an article for publication,

and I dare not ask you, a stranger, to edit it.

What I wish to say is, that I am so well pleased with the "Api" that I am recommending it to all beekeepers that come in my way. My attention was first called to it by my neighbor, Mr. Irwin. He presented me with the numbers of 1884. I read them all, over and over again, and was so well pleased that I determined to have the whole thing, from the start, and just at that time I discovered your "ad" in the C. B. J., offering with the whole outfit a fine queen as a present. I jumped at the chance. The bound volumes came along in due course of mail, and then the queen. She is a beauty. I introduced her at once to a frame of hatching brood, placed between division boards in a nursery hive, in the house. Two days after, added another frame and soon had quite a little colony. She now occupies a prominent place in the apiary, and bids fair to be as fine a colony as I have.

FRANCIS D. HAVENS.

P. S. I am not a woman, but I happen to think of something more. If you would like to hear anything more about Santa Barbara beekeeping you might drop me a postal.

F. D. H.

Santa Barbara, Cal., Aug. 1, 1885.

THE SPIDER AS A COMB PROTECTOR.

MESSRS. S. M. LOCKE & CO.

Under the above title an article was published in the July number (1884) of the "Api," translated by myself from the German of W. Eckhardt. He described his method of preserving surplus combs from season to season, by putting them into a box containing spiders and their eggs.

I have been much troubled by the loss of combs through the depredations of the moth, and last fall I did as directed in the above mentioned article, and put all the spiders and eggs I could get into my comb box, closed it, and waited.

This spring on opening it, I found every comb in perfect order. Thus, having tested this simple and effective measure, supplied us by nature, I take pleasure in calling the attention of beemen to it. I am now storing my box honey in spiders and cobwebs in the hope that they may be thus preserved for sale.

CHAS. L. COLTON.

New York, N. Y.

NOTES AND QUERIES.

—The October, November and December numbers of the "American Apiculturist" are to be the most valuable and instructive ever sent out.

Mr. J. E. Pond will conduct the department for beginners and the novice will find his papers to be invaluable.

—For a short time we offer the following inducement to those who are willing to work for us, and those who wish to obtain with but little trouble a choice queen.

To any person who sends us a club of five new subscribers either at $1.00 each, or at any of the club offers, we will make a present of one of our choice selected queens. In order that you will understand our offer we will cite an instance.

If five of your neighbors should choose to take advantage of our offer of the "Apiculturist," for one year with a choice queen for $1.50, and you should send us their addresses and $7.50, we would make you a present of a choice queen. Any member of the club can, however, take advantage of either of the club offers that he may choose.

This is a splendid opportunity for you to try our stock of queens.

—Mr. Arthur Todd is now conducting for us a series of papers entitled "Foreign Notes" which, as presented, forms a new and valuable feature heretofore neglected.

—Do hens eat live bees? A Los Angeles apiculturist seems to throw some light on this mooted question. He says that having often caught his poultry in the flagrant act—standing in front of the hives and taking the busy insects as they pass in and out—he finally despatched one and found in her crop 180 bees. No wonder the honey business is proving unprofitable in that State, if this is the general custom of the California hen.

—We are now printing 5,000 copies per month of our journal, and we mean before the season closes to place it in the hands of every bee-keeper in the land.

—We call the attention of our readers to the following offer:—

Apiculturist for 1 year,	1.00
Locke's Feeder,	.50
Apiculturist and feeder together,	1.15

—We are indebted to a friend for the following newspaper clippings:—

HIVING BEES.

This is rather a simple job to do when one knows how to do it, yet how many there are who seem to think they must comply with all the superstitious notions of ages past? Who has not seen and heard the hub-bub and fuss of hiving a swarm of bees by the old method. And too many stick to the same old style yet—the ringing of a bell, pounding the dish pan, etc., to drown the commands of the queen. We know now that all this is useless. If you have trees or bushes handy for the swarm to cluster on, you will rarely lose a swarm, as it is very seldom that one goes off without first settling. You should have some good clean hives, in a cool place, ready for the swarms when they come.

If you have a number of stocks that you think likely may swarm right away and cause trouble, as soon as you see a swarm issuing, fill your garden sprinkler with water and sprinkle those stocks that have given signs of swarming, which will hold them in check till your swarm already out can be hived. If another begins to pour out after the first one is clustered, but before you have had time to hive them, throw a sheet over those clustered to prevent the others from alighting there also. I have had as many as three such clusters covered at one time, other swarms coming out too fast for the first to get out of the way.

Let your swarm have plenty of time to cluster; no need to be in a hurry if they cluster well. If they light on some tree or bush that you do not care about marring, cut off the limb or limbs they are on, and carry to where your hive is, which in this case may be where you want it to stay. Place a cloth drawn in front of the hives so the bees can have a clean road to the entrance. Holding your cluster within a foot of the entrance, give it a slight shake—enough to throw off part of the bees—they will soon find the entrance, and, setting up that happy hum which is music to the beekeeper, will travel in; then when they are all well under way, shake off some more, holding the branch meanwhile over those shaken down, which will attract and catch those that may take wing. Should you shake them all down at once and step to one side, you may have the fun of seeing them form another cluster for you to cut down. Watch the corners, and see to it that the stream of bees does not get down under the hive or alighting board; keep them in the ranks by brushing back gently with a wing, or blowing

a light puff of smoke in their faces now and then. Keep them moving till you get them all in, else your queen may be outside, and the swarm come out to find her.

It is of importance that you give them, if possible, a small patch of brood in a frame, as a new swarm rarely leaves a hive with a brood in it. Never leave a new swarm where it is hived till sundown; this is a mistake—one which loses you many bees, for in less than an hour they will locate their new home and be carrying honey and pollen. If you have to move it then, do so when they are all in. In case your swarm alights away up on a tall tree, or on branches you do not wish to cut off, have a sack made of common muslin, about three feet long and fourteen to sixteen inches in diameter. Sew a small finger loop on the bottom of the sack both outside and in. Bend a ¼ or ⅜-inch iron rod into a round hoop for the mouth of the sack, letting the two ends be welded together three or four inches to form a handle, and sew the ring fast to the mouth of the sack.

Next get a good stout pole of such a diameter and length as to handle best for the height of your trees, or make one out of a 2 x 2 piece of pine. Bore a hole in one end and insert the handle of the iron hoop, fastening so it will not turn. Have another pole (or a half-inch rod may do) with a hook on one end. With these two tools you can get down a cluster from quite high places by using a ladder part way. Hold the sack up till it touches the limb, the cluster being inside; then give the limb a jerk with the hooked pole, drop the latter and turn the hoop quarter way round, which closes the sack with the bees inside. Lower the sack and carry to your hive, put your finger through the loop on the bottom, end it mouth down, and shake out the bees. The loop is to prevent the crushing of bees inside by grasping with the hand. Turn the sack wrong side out by passing it through the hoop, and the few bees remaining are on the outside. We are indebted for this sack-hiver to Charles Dadant & Son, Hancock County, Ill.

Should your bees cluster on the body of a tree, or down among the roots of a bush, place your hive or a box up over the cluster, or next to it as near as you can, and stir them up by a little smoke on the opposite side. Soon a few bees will find the way in and set up their cry, "Here is a home for us; come on boys," and the rest will follow. It at any time they lag on the way in, and stop in little clusters, a little puff of smoke, or drawing a small bunch of grass or leaves over their backs will start them on again. Some sprinkle the cluster with water before hiving. I could never see any advantage in this, any more than in the rant and noise of old times. Keep quiet and enjoy the music of a swarm of bees on the wing.

ARTIFICIAL PASTURAGE FOR BEES.

Not enough attention is paid to this subject. If beginners would study the honey resources of their locality, and if their bees lack pasturage, supply them with more by sowing honey plants, there would be fewer beekeeping failures than now. I do not think that it pays to cultivate any plants for honey alone, but there are good honey plants that pay aside from the honey obtained from them. One of the best of these is alsyke clover. This does well on almost any soil, but is best adapted to moist, heavy clay soils, and in such localities it will outlive red clover. The hay made from it is fine in quality, and is equal to any of the clover or grasses in use for pasturage for stock. In this locality it is one of our best honey plants. It comes in bloom about a week earlier than white clover, and under good cultivation yields a larger amount of honey.

Basswood, or linden as it is sometimes called, is one of our finest shade trees. It is hardy and bears transplanting well, is a rapid grower, and seldom fails to yield large quantities of honey, which, when well ripened in the hive, is in every respect as good as that made from white clover. Buckwheat comes into bloom directly after basswood in this locality; it can be raised on almost any soil, but yields more honey if the soil is well cultivated. This is true of almost any honey plant; one acre of buckwheat, on rich soil, well cultivated, will yield more honey than several acres would on poor soil. Although buckwheat honey is of an inferior quality, and does not command so high a price in market, yet it is a source of much profit to us, for we extract the early honey and let the bees fill their combs with buckwheat for winter stores. The raspberry is quite an important honey plant, and although, in this locality, it blossoms about the same time as white clover, it is a much more valuable honey plant, for its drooping blossoms protect the honey from moisture, and the bees work upon it when the weather is so wet that they can obtain nothing from upright blossoms. No one should think of giving up beekeeping as a poor business because of poor locality, until he has tried to improve it by sowing honey plants, for I believe that beekeeping can be made profitable in almost any place by a little judicious management.—O. G. Russell.

Chenango County, N.Y.

BEES POISONED BY GLUCOSE.

Professor A. J. Cook of Michigan Agricultural College says in regard to glucose — We had come to regard the dictum of the National Academy of Science as conclusive on whatever it pronounced an opinion. Its recent decision, however, in reference to glucose may well shake faith in its infallibility. If glucose is always "entirely wholesome," why does its use so often bring such widespread disaster in wintering bees? Granulated sugar is better for bees, many think, than honey; no one doubts that it is equally good. Glucose, on the other hand, has given such fatal results with so many, that it is everywhere condemned. An actual case of poisoning in Michigan, by the use of table syrup, led to an analysis, which showed the presence of sulphuric acid.

BEES IN ORCHARDS.

It is said a larger crop of apples is raised when a hive of bees is stationed in the orchard. The bees visit every flower, busily flying from one to another, and then passing to an adjoining tree. The pollen on their bodies is rubbed against the pistils of myriads of flowers, which become fertilized in this way. Many of the strange modifications in the form of flowers are due to insects, the transfer of pollen from different varieties resulting in hybrids. Darwin remarks that "all experimenters have been struck with the wonderful vigor, height, size, tenacity of life and hardiness of their hybrid productions." He was the first to show that, from a flower fertilized by pollen from a different plant, the seedlings were much stronger than from its own pollen. The wind and insects are Nature's great agents in performing this act of cross-fertilization. The stamens and pistils of the pines, birches, poplars, grasses, corn, etc., are so arranged that the wind fertilizes them—but in a large number of flowers they are so situated that they can be reached only by the agency of insects. The moths, many of which have tongues five inches long, probe the long tubular flowers of orchids and other plants, and withdraw them loaded with pollen, to leave it on the pistil of some other plant.

CONVENTION NOTES.

The Wabash County Beekeepers' Convention will meet in G. A. R. Hall, North Manchester, Ind., on Oct. 10, 1885. Beekeepers everywhere are most earnestly requested to be present.

J. J. MARTIN, *Secretary.*

North Manchester, Ind.
Aug. 20, 1885.

The New Jersey and Eastern Beekeepers' Association, having accepted an invitation to meet with the Mercer County Board of Agriculture of Trenton, N.J., will hold their semi-annual Convention, in the Grand Jury Room, Court House, at Trenton, New Jersey, on Thursday, Nov. 5 and Friday, Nov. 6, 1885, at 10 o'clock A. M. A full attendance of the members is requested. To all persons interested in our vocation we extend a cordial welcome. The Committee of Arrangements have secured hotel accommodations at reduced rates.

A. J. KING, *President.*

WM. B. TREADWELL,
Secretary.

INDIANA STATE FAIR.

The present season, so far, is the most productive in the history of the state. The grass and hay crop, the most important of the products, is immense, and all that could be desired. The corn crop, second in importance, is magnificent; the recent hot weather, with the propitious rains, has given it boom by which it promises to excel, in this state, any previous year by several millions of bushels.

The wheat crop, although comparatively light in quantity, is of good quality and exceeds all anticipated estimates, with enough and to spare.

The oat crop is the largest ever grown in this state, by one-fifth, and the potato crop, the most indispensable to the human family, will be of such proportions that we could feed the world. Mother Earth is certainly doing her full share to bring about good times and make happy all her diligent children.

These facts, in connection with the auspicious omens in the rooms of the Board of Agriculture, in the shape of business connected with the State Fair, to commence September 28th, give assurance of another grand success.

It has been asserted that the last Indiana State Fair was the best agricultural exhibition in the United States. This is not mere assertion, for the facts can be easily produced to prove it, and the management have reason to expect this season an improvement on the last.

The Fair has outgrown its clothes; the greatest want now is more room to spread itself, and the day is not far distant (for the idea is now being entertained), when all vehicles will be shut out from the ground during the Fair, to give room for the exhibits and visitors.

The railroads promise better rates than ever, and there is hope of some of the prominent men of the nation being present at the fair.

R. M. LOCKHART, *Pres.*

ALEX. HERON, *Secy.*

Indianapolis, Aug. 12.

EXCHANGES.

CALIFORNIA HONEY CROP. — The following report of the honey season in California, from a correspondent in that State, dated June 9, 1885, will doubtless be interesting to our readers. Does it not furnish a pointer to the honey-producers of the country, as to the future of the honey market? A light crop in Cali-

fornia means better prices all around, now that foreigners are finding out what a good thing American honey is—to take. "Reports from all quarters of southern California agree that while the bees are in good condition, they have not stored much if any surplus honey, and in some localities they have actually reduced their stores very materially. The cool nights and windy days of the past month have not been favorable to the development of honey-producing flowers or the secretion of nectar. Both sorts of the sages are in bloom, but they afford little honey as yet, and what is stored is not in any respect equal to the honey obtained in the same sections last year at this date. The low price of honey quoted in all the markets is not encouraging, but the values of other commodities are about on a par with honey. Sugar competes somewhat with honey, and the price of that article points still downward in the principal marts of the world, and it is not reasonable to suppose that honey will advance in price very materially, until sugar regains its lost ground to some considerable extent, not only in the United States, but in European countries where a very large quantity of our last year's crop of honey found customers, who paid better prices for our product than could be obtained at home, or on the east of the mountains."—*A. B. J.*

WOMEN AS BEEKEEPERS, BY REBECCA HARDING DAVIS.—The advantages of both beekeeping and poultry raising as an employment for women are great for these reasons:

1. They can be followed at home. Whether on a farm or in town, or even in a city, if you can have the ground necessary to set the hives, it is all the land you need. No matter if you do not own the land, or, if your lot is small, a place can easily be made on the roof of a house, shed or barn.

2. It is not necessary in the case of bees to raise anything for their support. There is not a home in the country where this need be done for a few hives.

3. Any woman or girl can not only make honey boxes, but the hives themselves, as these can now be bought all ready to nail together, so that putting them up and painting them require no strength.

4. The capital necessary to commence with is small.

The little time required for their care can be secured without interfering with other occupations. A mother can care for her children while she attends to her bees. (My own successful work with bees was done with an infant in my arms, or in a baby carriage, and the other children barely able to play alone, but all the time within reach of my voice.) A teacher can care for her bees out of school hours, and after she has a start, make more from them than from her other work. We have in mind teachers who have also found health in the out-door air and exercise which their bees gave them.

5. There is a fascination about the business which relieves all its tedium. A woman will think of her bees, study about them, and become so interested as to be almost paid for her work by the love of it.

QUESTIONS AND ANSWERS.[1]

ANSWERS BY G. W. DEMAREE.

1. When I did my first Italianizing I knew nothing of the modern science of queen-rearing. I removed the queen from a strong colony, and seven days afterward destroyed all the queen cells, and again on the tenth day from the day I removed the queen, I looked all the combs over and destroyed everything in the shape of queen cells—making sure that no unsealed larvæ were

[1] These answers to questions in last month's issue came too late for insertion in that number.

left in the hive. I now removed one of their combs, and put in its place a comb containing eggs and larvæ just hatched, which I had taken from my *tested* Italian queen. On the seventh day thereafter, I removed as many black queens as I had cells in my cell-rearing hive—save one for them—and on the tenth day from the time I inserted the comb, I cut out as many cells as I had removed queens, and proceeded to insert one cell between the top bars of the frames of each hive. I placed the cells in such a position that I could see if the queen cut out at the *end* of the cell, by simply raising the quilt or honey board. If I found the cell opened at the side, I knew at once that was a failure, and proceeded to give them another cell. In order to have cells on hand, I set two or more colonies to rearing cells at intervals of three days apart. A novice can hardly go wrong by this simple, tedious method. Of course, I now follow the more modern methods.

2. This is a question of deep interest to me, especially as pertains to introducing virgin queens. The dangers are that the bees will "ball" and kill, or injure for life, the queen before she is accepted. The only way I know to avoid it is to keep the queen caged till the bees show by their actions that they are reconciled to her.

3. The bees seem to know that a virgin queen is of no use till she is fertilized, and they look on her as an intruder and disturber of the peace. Perhaps her shy, unsteady ways provoke an attack from the bees. I have found that scary, fertile queens are more likely to be "balled" than are the gentle, steady ones.

4 & 5 I have never discovered much difference in the several races of bees in this respect.

I have found that the black and hybrid queens are more fidgety as a general rule than are the Italian queens, and this trait is not favorable to quick introducing.

6. I proceed in the usual way, except that I keep the queens caged a greater length of time. I still insist that the only safe and practicable way to introduce queens is to cage them on top of the frames, where the actions of the bees can be seen by simply turning back the quilt. As long as the bees "ball" and bite the cage, the only safe place for the queen is in the cage. When they walk about the cage gently as they do in other parts of the hive, the queen can be safely released. When I find this state of things, I remove the slide and stop the door in the cage with a plug of soft candy, and leave the bees to release the queen.

Christiansburg, Ky.

ANSWERS BY A. J. COOK.

1. Buy a good Italian queen early in the season. Stimulate the colony when she is introduced by feeding and adding brood so as to get early drones. Keep drones out of all other hives, then rear and introduce Italian queens into all other colonies. This is done with ease, and is a very excellent experience to the young beekeeper.

2. Danger of the queens being killed unless *very young*. Caging for forty-eight hours is an almost sure preventive.

3. I do not know.

4. I have had experience only with German, Italian and Syrian. I find no marked difference in these three races.

5. I cage longer, and watch carefully as I liberate the queen. If she is not kindly received I cage her for another twenty-four hours.

ANSWERS BY E. E. HASTY.

1. The old bachelor's advice to young people about to be married was simply "Don't." If, however, the novice is too deeply in love with Italians for such advice as that let him buy three or four dollar queens of different breeders, test them thoroughly *for honey gathering qualities;* then from the one that proves the best, rear young queens by the Alley method. A second batch of queens may be reared to supersede those that prove impurely mated.

2. The dangers of introducing may be mainly reduced to two, the foreign scent of the queen, and her prejudice against her new subjects, leading her to behave improperly. The foreign scent is partly got rid of, and the scent of the new colony partly acquired by caging the queen for a day or so among the bees to whom she is to be given. To keep the queen from sulking, striking, and making noises, and other exasperating capers, take away all her own bees from the cage when it is immersed in the bees of the new colony. She thus finds absolute solitude unendurable and is obliged to make friends

with the bees on the other side of the wires. One thing a novice needs specially to be told is that in returning a queen to her own colony, after she has been used elsewhere, nearly the same care must be used as if she were a stranger.

If possible choose a time when bees are good natured and gathering honey.

Earnestly avoid having any robbing around the premises for a week before queens are to be introduced.

Avoid giving a strange queen to a colony that is *overworked at rearing young bees*, Bees often kill their own queens from this cause and will be pretty sure to kill a stranger.

Very late in the season is a specially bad time to introduce.

When circumstances are unfavorable keep the bees three days queenless before releasing a strange queen among them.

The surest way, when bees are desperately contrary, is to cage a whole comb from which young bees are emerging, putting the queen thereon, and leaving her and her young subjects thus segregated for a week in the heart of the colony.

3. A queenless colony desirous of more brood is greatly pleased with the scent of fertility which a laying queen diffuses. This scent operates as a bribe to make them overlook her foreign odor. In the virgin queen the scent of fertility is as yet very feeble, and consequently she is treated more nearly as a foreign worker bee would be treated

4 & 5. Very little difference owing to race, I think. I have rather felt that the more energetic a colony was the more resistance they would make to being re-queened. A strong colony of vigorous hybrids late in the fall is the "cap sheaf."

6. Would leave the hive longer queenless, and be more careful generally.

Richards, Lucas Co., Ohio.

QUESTION BY A BEEKEEPER.

1. What do you think of using ether for controlling bees?

Ans. While in the hands of an experienced apiarist and used with discretion ether might prove useful yet we would not advise its general use.

Punk (or rotten wood) properly used will meet ever requirement and is much more safe.

LETTER BOX.

Lindsay, Ont., Aug., 1885.

The pure Cyprian queen you mailed to me on the 11th inst., arrived at my apiary at 7 P. M , on the 14th, in good condition and without a single dead bee in the cage. I immediately placed the cage beneath the cloth cover of the brood chamber of a strong colony of bees. The next morning I made a rather weak colony queenless, removed the worker bees from the Cyprian queen, and placed her, still caged, upon the frames of the queenless colony. On Saturday evening I again examined the Cyprian queen, filled the food compartment of the cage and its opening with fresh, "Good" candy, stopped the entrance with an old queen cell, and replaced the cage with the tin cover open. When I examined on Wednesday, I found the cage deserted, nearly all the candy consumed, and the queen had laid a large number of eggs in two combs.

JOHN HEAD.

Cottage Grove, Ind., Aug. 3, 1885.

GENTS:

American Apiculturist, Vols. I and II, cloth bound, received some time ago, and I must say I was most agreeably surprised on receiving the same. I have since perused a good part of the work and like it much. Hardly know how any beekeeper can do without it. You can just put me down as a regular subscriber as long as your journal is published.

With good wishes for your future prosperity, I remain very respectfully,

P. C. BARNARD.

South Bend, Ind., Aug. 24, 1885.

DEAR SIRS:

My son and I wintered 200 colonies of Italian bees in the cellar with the loss of but two colonies and five or six queens, and, you will remember, last winter was a severe one. After removing them from the cellar we sold all but 196 colonies and now have 250. Our bees had the swarming fever bad, causing much shortage in the honey yield. Bees are now doing well on red clover and buckwheat.

The bound volumes of the "Apiculturist" duly received. I find them filled with "good things" for the beekeeper. I consider the "Apiculturist" all but indispensable to the would-be apiarist.

A. J. HATFIELD.

The American Apiculturist.

A Journal devoted to Scientific and Practical Beekeeping.

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OBSERVATIONS UPON DRONES.

BY L. L. LANGSTROTH.

BEVAN says that the drone hatches on the 24th or 25th day after the egg is laid. I know of nothing more definite on this point.

To get more precisely the facts, on the 16th day of last July, a drone-comb was put, at 7 A. M., centrally in a strong colony, which had been fed for several days, as the drones were being expelled from many hives. At 9 A. M. the queen was found on that comb, having laid three eggs. She had just begun laying. At 9 A. M., on July 17, it was removed to a strong colony, without queen, eggs or larvæ. On July 27, many cells were capped, and on July 28, at 2 P. M., some 200 were capped, many eggs having, for some cause, disappeared. On Aug. 9, none had hatched. On Aug. 10 examinations were made every hour. At 5.30 P. M. none had crawled out; at 6.30 two had hatched, and a third was hatching. If these drones came from the first eggs laid, they took about 25 days and 8½ hours to develop.

At 6 A. M., on Aug. 11, many more had hatched, and at 6 A. M., on Aug. 12, all but 17 had hatched. At 6.30 P. M. all but 2 had hatched, and at 6.30 A. M. of Aug. 13, the last one was found with the cap off, trying to crawl out; it was strong and perfect. Now, if the egg producing this drone was laid just before the comb was removed, then it took nearly 27 days to mature.

During the whole time of these observations, the weather was of the most favorable kind—the thermometer ranging nearly every day above 80° Fahr., and being only once as low as 62°. The colony was kept in good heart by daily feeding, and I can think of nothing which could have retarded in the least the development of these drones, unless possibly the fact that from so many of the eggs having disappeared, they were not as compact in the comb as

they otherwise would have been. In this observation, although there could not possibly have been more than 24 hours' difference between the laying of the first and the last egg, there was about two days and a half between the hatching of the first and the last drone.

It is quite interesting to watch the different actions of just hatched workers and drones. The worker, true to her name and office, begins to crawl over the combs as if to feel her legs, stops occasionally to clean herself up, and before long helps herself to honey from an open cell. The drone, on the contrary, is a born dependant. His first act is to touch the nearest worker he can reach with his flexible antennæ, and, begging to be fed, he is at once supplied with honey disgorged from the proboscis of his attentive nurse. And so he goes on all his life, seeming to prefer to be fed, although perfectly able, if needs be, to help himself.

A very bad name has always been given the drone. Virgil has his fling at him, stigmatizing him as having no proper office in the economy of the hive—seeking only to devour the stores which he had no share in collecting. I wonder what the poet thought he was made for! or, as he says that the bees collected their young from the flowers, being too chaste to breed them, what motive he could have thought they had to gather in such useless consumers! And yet without any special pleading how much can be said in his defence! It is only too evident that his proboscis is too short to suck honey from the flowers; that his legs have no pollen baskets; and that he can secrete no wax. Great as his bulk is, he has no sting, and can do nothing for the defence of the commonwealth; but then, without him that commonwealth could have no existence. The sole object of his life seems to be, at the proper time, to fertilize the young queen—and this he is always ready to do. Now why should we blame any creature which fulfils the special object of its creation? And yet I fear me in spite of all that can so justly be said in his favor, our poor drone will always be cited as an incorrigibly idle reprobate, who meets with only his just deserts when after a life of pleasure he is killed without mercy by the industrious workers. He will always be known as Shakespeare's "lazy yawning drone."

Oxford, Ohio.

[*To be continued.*]

FOREIGN NOTES.

By Arthur Todd.

Camphor is well known as a preservative against moths in furs and cloth, also against mildew. From Russia we learn that Mr. Ossipow has been applying this substance as a remedy in cases of Foul Brood.

One spring he found he had two hives infected: one very badly, another slightly. He wrapped up in a piece of rag a piece of camphor the size of a walnut and placed one on the floor board inside each hive. Soon afterwards he noticed that the first hive

was completely rid of the disease. The bees of the second hive were noticed to go off gayly enough to the fields but, on coming back, showed a disinclination to reënter the hive. Believing they found the odor too strong, Mr. Ossipow withdrew the camphor for three days and put it in again at the end of that time; he continued this treatment for a month when he found all trace of the disease gone. For two months he allowed the camphor to remain in the worst affected hive and then found only four infected cells. Later on, the colony became very strong and in a perfectly healthy condition.

When Mr. Ossipow has found a case of foul brood since, he has put in his lump of camphor and invariably found the remedy effective. On the principle that prevention is better than cure, he puts in each hive every autumn a piece of camphor.

When living in Algeria some years back, I found that great reliance was placed upon the emanations from the leaves of the eucalyptus trees (the big gums of California) as a curative agent against fevers, especially those of a typhoid character. These trees all belong to the camphor family and I was informed that bees were always healthy when placed under one of these trees.

It is not very long since it was thought that the adulteration of honey made in a careful manner was very difficult or even impossible to detect. In Hager's "Pharmaceutical Manual" it is stated: "Very pure glucose or beet sugar mixed with honey cannot be detected with certainty;" and again, "Now that starch sugar is to be had so cheaply, bee men can use great quantities of it to feed their bees and in that manner obtain enormous quantities of honey." In many older books we find it stated that honey contains variable quantities of fruit and grape sugars and that the quantity of the latter increases as the honey gets older. If this statement were correct, then those above mentioned should be also; but, Dr. Fritz Ellsner has found by numerous experiments, it is not so, and he has proved that the determination of manufactured glucose used to adulterate honey is extremely simple. A great number of samples of honey having been given to Dr. Ellsner by the Leipzig Bee Society to analyze, he was able to study this question closely and, without speaking of his microscopical researches, he carried out a series of experiments to establish correctly a method for determining the exact percentage of manufactured glucose in any sample of honey.

A large number of samples of honey were obtained, their exact source of supply being known; ten per cent solutions of these were prepared, decolorized by animal charcoal, and submitted to examination under a Wasserlein polariscope. That instrument gives at once the percentage of grape sugar but is equally good for general observations. Here is the result:

1 Honey of Leipzig, Fennel in comb, 1 year old 0°.9
2 Honey of Leipzig, Colza comb, 1 year old 0°.
3 Honey of Leipzig, Colza and Fennel comb, 1 year old 0.°3

4	Honey of Leipzig, Heather candied, 3 years old	o°.8
5	Honey of Leipzig, Heather candied, 35 years old	o°.6
6	Honey, Wurtemberg, candied 2 years old	o°.3
7	Honey, American, candied, 2 years old	o°.6
8	Honey, Chili, candied, 2 years old	1°.
9	Honey, Wurtemberg (prepared cold), 4 years old	o°.
10	Honey, Thuringia, clover in comb	1°.2
11	Honey, Thuringia, spring flowers	o°.3

From this table it follows that all honey, no matter what the age and the source of supply, contains exclusively inverted sugar and, moreover, that the quantity of fruit sugar which, under the polariscope, turns the ray of light to the left, is constantly strong enough to compensate for the deviation to the right caused by the natural grape sugar. In a single word, then, *all honey, if it is pure*, is entirely without action on polarized light or deflects it slightly to the left, but *never* to the right. In order to know what action on polarized light a honey, produced by the feeding manufactured glucose to bees, would have, some direct trials were made.

It will be remembered that it is well known to beekeepers that glucose acts in an unhealthy manner, and often deadly, on bees; and that no well-read beekeeper would dream of feeding glucose to produce honey. With glucose food bees get the diarrhœa, their belly swells, then comes paralysis and death.

Notwithstanding that, and in the interests of truth, one of the members of the Leipzig Bee Society sacrificed a colony by feeding it glucose. He tried feeding it solid and in solution, but it was only after having mixed a thick syrup of it with equal parts of honey, that he could get his bees to take down any quantity. Having got a comb well filled it was extracted in the presence of witnesses. This honey had a good odor but was dark, very liquid and remained a long time as liquid as syrup.

From three different samples of this honey thus produced, were prepared solutions of twenty per cent, decolorized by means of animal charcoal, and the polariscope then gave the following results:

$$1° + 3°7$$
$$2° + 3°6$$
$$3° + 3°7$$

It suffices then, to have but a very minute quantity of manufactured glucose to obtain a striking deviation of the ray of polarized light and *that to the right.* These remarks were afterward verified by observations on solutions in which were mixed directly, from five to twenty per cent of glucose.

The Swiss honeys, of which mention was made above, *all* deflected, without exception, the ray of light in the polariscope to the right some 8° to 13° and were declared impure. The manager of one of the largest factories for Swiss honey, later on, admitted that all honey put up by his firm contained glucose; and that because the public demanded honey that would remain liquid and not candy which, in the eyes of the public, is a proof of purity. To prevent

trouble they labelled their goods not "Veritable honey from Bees," but "Veritable Swiss Honey."

It only remains to know if a honey obtained by feeding sugar can be regarded as pure. The producers, all competent judges, say "no." In general, sugar is only employed as a food in cases of real need, that is to say, for wintering, and within the limits of what the bees can consume themselves; when there is more than that it is only syrup without flavor or taste. Nothing then ought to be called honey except the actual product of the secretions of flowers, and stored therefrom by the bees.

The conclusions to be drawn from Dr. Ellsner's work therefore, are: first, all honey, that under the polariscope turns the ray of light to the right, is impure. Second, that the smallest quantity of manufactured glucose added to honey can be detected by using the polariscope.

Philadelphia, Pa.

IMPROPRIETIES IN JOURNALISM.

By S. Corneil.

Recently the *Canadian Bee Journal* republished an article on apiculture from the *Popular Science Monthly* and called attention to it in a flattering editorial notice, giving credit to the journal from which the article was taken. The editor of the *American Bee Journal* overlooked the editorial paragraph and took the editor of the *Canadian Bee Journal* pretty severely to task for publishing the article as if it were original matter. The same article was afterwards republished in the *American Bee Journal*, headed by the words "Popular Science Monthly" but any one who will take the trouble to compare it with the original will see that the editor of the *American Bee Journal* is guilty of the impropriety of mutilating the article by making alterations, elisions and additions. In doing so he is unjust to the writer of the article, unjust to the publisher, and he practises a deception upon his readers. There are in all about twenty changes, but I shall take space to refer to two only and leave the reader to say whether or not in making these changes, the editor shows a spirit of petty jealousy in excluding from his columns any complimentary reference to the editor of another bee journal.

In the third paragraph of the second column, page 390, of the *American Bee Journal*, we have this sentence: "For the Syrian races of bees leading apiarists claim, etc." In the *Popular Science Monthly* it reads: "For the Syrian races of bees Mr. Jones and other leading apiarists claim, etc." In the fourth paragraph of the first column on the same page of the *American Bee Journal* we read: "The Syrian and Cyprian varieties have been extensively imported into this country." In the *Popular Science Monthly* we find it thus: "The Syrian and Cyprian varieties have been extensively imported into this country by that distinguished and enterprising apiarist, D.A. Jones of Beeton, Ontario."

No doubt most of the readers of the *American Bee Journal* felt under obligations for the privilege of reading those very interesting articles by Mr. Frank Cheshire on Foul Brood, published about a year ago, but probably few are aware that they are so altered that the author would hardly know them. In an introductory paragraph we are told they are copied from the *British Bee Journal*, but on comparing them with the originals, we find that there are nineteen words and one phrase added, sixteen words, nine phrases, thirteen clauses, thirty-six sentences and *ten entire paragraphs* omitted, and seventy words, three phrases and two clauses altered by substituting others. In some cases the idea as well as the phraseology is changed and yet Mr. Cheshire is held responsible before the public. In the seventy changes of words the good Anglo-Saxon word "stock" is invariably changed to the less appropriate word "colony;" "hive," when used so as to mean the contained for the container, is changed to "colony," and the word "apiarist" is always substituted for the more euphonious word "apiarian." Even if it were allowable to make changes in the language used by a writer, in such a case some of the changes made cannot be defended. For instance, Mr. Cheshire quotes a paragraph from "Carpenter on the Microscope" in which this phrase occurs: "The mortality caused by it (Pebrine) being estimated to produce a money loss of from three to four millions sterling annually for several years." This language of the great Dr. Carpenter should be good enough, but it does not come up to the standard required by Mr. Newman. "Millions sterling" must be changed to "millions *of* sterling" before it can be permitted to appear in the pages of his journal. Altogether the changes are so extensive and so important, that those who wish to see what Frank Cheshire actually did say on Foul Brood, will have to read his article in the *British Bee Journal*.

Lindsay, Sept. 8, 1885.

THE NEW vs THE OLD.

No 2.

By T. O. P.

In our journey through life how often we make comparison with the old. Those who have lived any number of years look with wonder at the rapid march of improvement, and yet often can compare the good old times with the new, with the advantage on the side of the old. One reason for this is the fact that there are two forces that travel equally fast and side by side. For instance one man wants a gun whose missile will penetrate the armor of any ship or fort known, but simultaneously with him, another is inventing an armor that is able to resist it, and so it goes, one man's ingenuity arrayed against another's, and great results are accomplished; yet in reality the situation is unchanged. These comparisons can be made in almost every branch of science. In the science of apiculture the comparison between the old and new is one that gives pleas-

ure and satisfaction, at least to the progressive beekeeper if no pecuniary gain follows. In our last we made some comparisons between the old and new methods of introducing queen bees; we might also, if we felt capable, compare the new *vs* the old method of raising them and show that although the acme of success has been reached, yet the expected pecuniary results do not follow. Suppose we compare the old box-hive and method of getting the old style of two comb four-pound boxes of comb honey therefrom. I fancy that Capt. Hetherington can look back to those days and find the advantage financially on the side of the old. He may be able by the new to produce four times the amount of honey and in a style that outshines the old as the electric light outshines the rust, but that *other force* has brought the price down to such a figure that the net results in bank will not compare with the old. But to view it through the eyes of a philanthropist may give some satisfaction, as many eat honey *to-day* that could not get a smell *then*. I see in the Sept. "Api" some notes on "Advanced Bee Culture" from L. C. Root, in which he gives some astonishing figures, the result of the *new vs* the *old* under favorable circumstances. Well, in this branch of our science the *old* certainly cannot compare favorably with the new but this is one of those cases where we can almost say a *new article is produced;* as the present production of extracted honey can not be classed as the same goods with the strained honey of *old*, and yet, I fancy Mr. Root carried more money home in his wallet from his honey sales twenty years ago then he does to-day.

Still we would not go back to those days. Although we may not be as well off pecuniarily, we are *rich* in knowledge. Our children enjoy the advantages of an enlightened age. Where we paddled our canoe, they ride in steam palaces; where we jogged along in the old stage coach, they are whizzed along by the lightning train; a day with them now was a week with us then, and we look on and wonder, and grow chronic in making comparisons with the NEW *vs* THE OLD.

Brooklyn, N. Y.

THE UTILITY OF FEEDERS.

BY HENRY ALLEY.

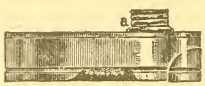
A GOOD bee feeder is appreciated by every apiarist, as every one who keeps bees has more or less use for such an article during his beekeeping experience. There are in use as many styles and *patent* feeders as patent hives. All of them possess more or less merit, and nearly all will do the work for which they were designed. I do not have a very good opinion of an "entrance" feeder. Unless great care is used, robbing will be induced. Then again, what advantage does an entrance feeder have over a feeder used over the frames? The former can be used only while the weather is warm, as the bees will not and cannot cluster near the feeder to keep up a proper warmth while at work removing the syrup.

The above are very serious objections to an entrance feeder. Now

I will give some of the advantages of feeders used over the combs. A properly constructed feeder can be placed upon the frames and directly over the cluster at any season of the year. It can be covered by a chaff cushion, or some warm material and retain the heat. The bees can take the food from it and not leave the cluster. A feeder of this description can be filled without disturbing it or the bees even, as often as the food is removed. During my long experience with bees, I have been obliged to use feeders, more or less, every year during some portion of the season. My experience with such implements will equal that of any man in the bee business. I have used every kind of a feeder thus far presented, and have finally settled upon the two best adapted for general use.

The one is a glass fruit jar; the other "Locke's Perfection Feeder." Both embody the same principle, namely: atmospheric. The latter has many decided advantages over all others in use. It is made of tin, and can be made large enough to hold several quarts of syrup. The samples which I have seen, and which are sent by mail, are made to hold about one pint of syrup. There are apertures in the top and bottom. The one in the top is for the reception of food, while the one in the bottom is closed with a sponge from which the bees sip the food and place it in the combs for further use. The cap which covers the opening in the top, through which the food enters, fits so nicely that no air can enter, and also prevents any scent of the food from escaping. Therefore, when one of these feeders is placed upon a hive unprotected by any covering, no robber bee can enter or even get a sniff of the contents of the feeder. We have used them this fall upon some hives and have not protected them at all from the weather. The heaviest rain that ever descended cannot enter the feeder, either at the top or about the bottom. It is weather- and robber-proof in every sense of the word.

For a hive that has a honey board, a mat or plain top, it requires about one minute to apply the feeder to it. All that is necessary is to make an opening about $1\frac{1}{4}$ inches in diameter in whatever covers the frames; and when the feeder is ready, let the sponge come directly over the aperture made to give the bees access to the feeder. I have no doubt that this feeder would preserve a colony



through the winter, even though it had no capped honey at all. If the bees are kept in a cellar or repository where the temperature is kept at 45°, they can sip the food from the feeder as easily as they can take honey from the combs. One of these feeders could be made to hold a sufficient amount of food to last a colony through the winter. It could be filled in the fall and need not be disturbed till spring. Their cost certainly can be no objection to their general use.

The illustration here given repre-

sents a feeder holding about one pint. One that has a capacity of several quarts costs but a trifle more than the pint feeder.

Wenham, Mass.

NORTH AND SOUTH IN BEE CULTURE.

By Abbott L. Swinson.

A great deal has been written *pro* and *con* in regard to pollen theories in the diarrhœa troubles among bees. I must confess that the article of G. W. Demaree, in your last issue is pretty near the truth, as near probably (?) as any article that has been published in regard to these diarrhœa troubles. That the cause must be "climatic" is pretty well proven by the fact that there is no such thing among the bees in the south as diarrhœa or foul brood, while our northern brethren are more or less troubled with it every season. These are facts that our theorizing beekeepers should not overlook.

We lose no bees here during winter or spring, except from starvation, that is usually brought about by the bees being kept principally in old box and gum hives, and their keepers robbing them in June and July, after the honey flow is over, and taking out too much of their stores, not knowing how much is being left. The black (or German) bees store but very little honey after June 10, in eastern North Carolina, the main honey flow being during the month of May, from black gum, poplar, low-bush huckleberry, holly and gallberry. The Italian, Syrians and Cyprians do much better after the main honey flow than do the blacks; they usually store twice the amount of honey from June 10 to October that the blacks do. They stored a good deal of honey this season for me, from cotton and sumac, beginning about July 20 and ending Aug. 15, while the blacks in this section were doing nothing. Bees fly out here nearly every week in *winter* during the middle of the day. They gather plenty of pollen during February from alder, (not elder). I had queens reared, mated and laying April 8, this last spring. I find southern-bred queens live longer and are more prolific, here with me, than are northern-bred queens, which I have bought up north, notwithstanding the complaint against "southern queens" by some of the northern beekeepers.

THE BEST BEES.

The American Italian (Albinos) are the coming bees (?). I have tried for the past two seasons the crossing of Italians, Cyprians and Syrians as suggested by Mr. Demaree, under the above heading, and I have come to the conclusion that the American Italians are the best bees on the American continent— Carniolans not excepted — for purity, gentleness, beauty, prolificness, size and working qualities; they are certainly the "yellowest" and whitest marked bees we have. The young of eight queens that I now have are nearly white, when first hatched out, but after they become exposed to sun and heat in working, they show four to five yel-

low bands (when they are expanded with honey) and the white and black (it is not such a deep blue-black as most albinos show, either) bands around the abdomen are about an equal width. This has been brought out by careful breeding and selecting of the best queens from which to breed drones and queens among my Italian stocks—by in-and-in breeding too—that is, drones and queens all from the same queen, as all these American-Italians. I have twenty queens of them, but not all of them show uniformly marked bees of four and five bands as do the eight selected ones, bred and mated to drones of one mother, which I bought last season in a lot of nine untested queens of a Tennessee breeder, that showed her progeny to be extra fine Italians; but those bred of *her* and *mated* to *her drones* are much finer and far ahead of any bees I ever saw among Italians, Cyprians or Syrians.

Goldsboro, N. C., Sept. 22, 1885.

A GUIDE TO THE BEST METHODS OF BEE-KEEPING.

By J. L. Christ.

R. F. Holterman, Translator.

(Continued from p. 129, Vol. III.)

OF THE GENERAL USE OF THE HIVE.

The use of the hive generally is very much greater than keeping bees in ordinary straw skeps and the comparative value of the use of them for one year is as five to one; and when one takes into consideration all the advantages in beekeeping, the comparative estimate is a low one. How easily may an apiary, composed of ordinary straw skeps, be in one year totally annihilated; hives, however, very seldom, because such, owing to the number of bees contained therein, can, in the few good days, carry in at least sufficient to secure their winter stores. Adverse circumstances of all kinds, such as poisonous mildews, robbers, cold winds in spring, hail storms in summer, strong colonies can overcome more easily and their broods can soon make up the loss; but weaker colonies, such as those in straw skeps usually are, become depopulated and on account of such a rapid and sudden depopulation become foul-broody and at best they cannot recover themselves for the year or many days. A hive seldom becomes entirely depopulated: at least we have but few examples so far; then such a populous colony commences to raise brood in January, yes, even in December, and on account of the heat generated by the bees this is done successfully and therefore should the queen even be lost in April a new queen can be raised. With the hive one can secure the nicest store of honey and wax, without it being necessary to destroy the useful insects, without cutting the comb, and thereby endangering the bees and one's self and causing much unpleasantness.

In skeps the best colonies often ruin themselves by repeated swarming, but in hives one can hinder their warming and some years prevent it altogether. In the case of hives they

are rejuvenated nearly every year and if it has stood for twenty-five years it is not an old colony, as nearly every year new "Untensätze"[1] are built full and the previous year's combs are taken off through the upper stories. The combs do not become blackened, the cells do not contract as in old skeps, as every young bee leaves her pupa garb behind her and the cell is valueless for the full maturity of the brood. The reason is that a skep which has been in use five or six years without changing combs is of little value and the bees will seldom swarm.

It is on account of this also that with the hive there becomes no old colony; but clean, nicest and best of honey is produced. On the contrary, that cut out of old skeps, or procured by smothering bees, is soiled by brood, dead bees, sulphur fumes, etc. And what is an advantage above all others in the hive is that one in the latter always has bees, which can be taken care of pleasantly and without great fatigue.

THE SPECIAL ADVANTAGES OF WOODEN HIVES WITH GLASSES.

As it has for some time been proven by experiment that beekeeping in hives is the best and most profitable according to my actual test, my previously described hive, made out of boards and the top story furnished with a pane of glass, is the best and has distinct advantages over the hive made of straw. I will not speak of the ornamentality and general appearance which are given to a bee stand[2] or garden by a number of wooden hives having a symmetrical appearance, which is no matter of indifference to a person of taste and a lover of bees; but how profitable and easy and at the same time how pleasant does that insignificant glass, which only costs a kreutzer (half-penny), make the handling and tending of the bees!

I can not only amuse myself at their internal work and observe them summer and winter, but sometimes have the good fortune, especially in May and June, to see the queen with her body guard and watch her deposit eggs, etc.; while, on the contrary, in the straw skep, I can observe nothing but their outer industry and their flight. But I have a visible proof of their inner economy which is very profitable and necessary to the bees. I see how much honey they have, how much brood, how much they have built and this is (as can be seen from what follows, in harvesting honey, in dividing or swarming, by adding stories and other operations) of the utmost importance, in removing stories filled with honey. I can see how much I can take from these stories without taking too much from the bees and leave them enough for winter.

I can calculate how many feet or pounds of honey, how much wax every colony has, yes, how much fifty colonies have; as every story has equal dimensions and the pattern shows me that such a story when empty will contain four measures, when filled it will contain two measures of honey and "1½ quarter lbs." of wax. With straw hives, where I know nothing definite, I must take

[1] Literally, things placed beneath.
[2] Apiary would be a better term.

such a heavy colony and, with many difficulties and no little danger, weigh it and then guess at the amount to deduct for the hive itself.

Further, if I wish to prevent a colony from swarming altogether or the second time, I must give them another story at the proper time; that is as soon as they have the last story a little over half or at most three quarters full which I can see with my hive at any time, but with the straw hive one must, with great trouble and danger and displeasure to the bees, tilt over the hive to see, and should it be seventy to eighty pounds in weight such is almost impossible. And should a straw hive have only three stories on and one were to turn it over, it would be easy for a story to fall off unless the hive was built in an expensive manner. Yes, in many cases it is absolutely necessary to be able to see and examine the inner economy of every story, especially in making nuclei, so as to know where to divide; it is necessary to examine the old as well as the nuclei (the upper stories to be lifted off as well as the lower which are to remain) for brood and such like. The cleanliness and smoothness of the glass and the planed board are acceptable and pleasant to the bees; they save thereby not only much time and labor which have to be expended on straw hives in biting and tearing off loose pieces and carrying them out, which time could better be expended in procuring their best and most necessary harvest; they also have no danger from moths which we all know not only gnaw themselves into a hive but which secrete themselves in the straw and then are not so easily dislodged by the bees.

Rodheim, Germany, July, 1783.

[*To be continued.*]

EDITORIAL.

THE season of 1885 will be remembered as one of the best the beekeeper has experienced. As a rule, large crops of honey have been gathered, and the increase in colonies has been satisfactory. At the beginning of the season the prospect for the beekeeper was a gloomy one. We had just passed through one of the most disastrous winters to bees yet experienced, and thousands of beekeepers were ready to give up the business in disgust. Now our apiaries are in fine running order again, and we can take fresh courage, as we are sure to be well repaid for all the trouble and time devoted to our pets.

Like all other business, beekeeping has its "ups and downs" but no one should be discouraged by meeting with an occasional drawback; we must expect to experience disaster and ill luck sometimes. Neither should we expect or look for a large crop of honey every year. Last season Californian beekeepers sent an immense crop of honey to market; this year they have but little, if any, to send. Last year bees did poorly in Vermont; this year they have done extra well. Do not get discouraged, push on as if nothing but prosperity was certain to crown your efforts. If disaster comes, repair the damage as quickly as possible and push right on the same as though nothing of consequence had happened.

NEW OBSERVATIONS ON THE NATURAL HISTORY OF BEES.

By Francis Huber.

(Continued from p. 204, Vol. III.)

This second absence was much longer than the first; it occupied twenty-seven minutes. We now found her in a state very different from that in which she was after her former excursion; the organs distended by a substance, thick and hard, very much resembling the matter in the vessels of the male; completely similar to it indeed in color, and consistence.[1]

But more evidence than mere resemblance being requisite to establish that the female had returned with the prolific matter of the male, we allowed the queen to enter the hive and confined her there. In two days we found her belly swollen, and she had already laid nearly a hundred eggs in the worker cells. To confirm our discovery we made several other experiments and with the same success.

I shall continue to transcribe my journal.

On the second of July, the weather being very fine, a number of males left the hives and we set at liberty a young virgin queen eleven days old whose hive had always been deprived of them.

Having quickly left the hive, she returned to examine it and then rose out of sight. She came back in a few minutes without any external marks of impregnation, and departed again in a quarter of an hour with so rapid a flight that we could scarcely follow her a moment. This absence continued thirty minutes, but on her return the last ring of the body was open, and the organs full of the whitish substance already mentioned; she was then replaced in the hive from which all the males were excluded. In two days we found her impregnated. These observations at length demonstrate why Hattorf obtained results so different from ours. His queens, though in hives deprived of males, had been fecundated, and he hence concludes that sexual intercourse is not requisite for their impregnation, but not having confined the queens to their hives, they had profited by their liberty to unite with the males.

We, on the contrary, have surrounded our queens with a number of males, yet they continue sterile, because the precautions for confining the males to their hives, had also prevented the queens from departing to seek that fecundation without, which they could not obtain within. The same experiments were repeated on queens twenty, twenty-five and thirty days old. All became fertile after a single impregnation. However, we have remarked some essential peculiarities in the fecundity of those remaining in the virgin state until the twentieth day of their existence, but we shall defer speaking of the fact until being able to present naturalists with observations sufficiently correct and numerous to merit their attention. Yet, let me add a few words to what I have already said. Though neither my assistant nor myself has witnessed the commerce of a queen and a drone, we think that after the detail which has been just commenced, no doubt of the fact can remain, nor can its necessity to effect impregnation be disputed.

[*To be continued.*]

[1] It will afterwards appear that what we took for the generative matter was the male organ left in the body of the female, a discovery which we owe to the circumstance that shall be immediately related. Perhaps I should avoid prolixity by suppressing all my first observations on the impregnation of the queen and passing directly to the experiments that prove she carried away the genital organs but on such observations which are both new and delicate, and where it is so easy to be deceived, I consider that a candid avowal of my errors is doing the reader service. This is an additional proof to so many others, of absolute necessity that an observer should repeat all his experiments a thousand times to obtain the certainty of seeing facts as they really exist.

EXPERIMENTAL BEE FARM NOTES.

In May we had seventy colonies of bees; some of them were in bad condition owing to the cold and backward spring. We have reared and shipped not far from 1500 queens of all races, also a large number of 1-, 2- and 3-frame nuclei, beside the full colonies.

We also made up and run 315 nuclei during the season, and now have sixty strong colonies of bees of the finest Cyprians, Syrians and Italians to be found in the country.

Of all the queens shipped, but a small number have died in the mail, and only three have been reported impure.

Nearly all of our customers have expressed themselves as entirely satisfied with the purity and quality of the queens and bees sent them.

From Aug. 24th to Sept. 10th the weather was very unfavorable for bees, especially for queen-rearing. It was cold, cloudy, and the temperature fell to nearly the "frost point" almost every night up to Sept. 10, though we had no frost to kill the fall flowers, and the bees are still gathering honey.

Just as we had made preparations for feeding our entire apiary a warm wave set in and but little feeding was necessary.

The only danger to be feared from this late flow of honey is a change to cold again, as much of the newly gathered honey is unsealed, and continued cool weather would drive the bees from the outer combs and the honey unsealed would remain so and would sour, run out of the combs and daub the bees.

Of course the colony in such a condition would perish. We hardly think that by extracting the unsealed honey it would be of much benefit, as the disturbance to the bees so late in the season would result in about as much danger as the unsealed honey, in case it should sour and daub the bees.

In case the weather continues warm, but little unsealed honey will be found in the combs by the middle of October.

Cell-building was discontinued before the last of August, but we had a large number of cells to "hatch" during the early part of September.

Here in New England it will hardly do to rear queens (start cells) in September. Generally the weather is very fine during the month and no trouble is experienced in getting the young queens mated. At this season of the year very few drones can be found in the hives except in those in which drone-rearing has been encouraged, or in such queenless nuclei as are used for our supply of late drones, and the queen "breeder" is pretty sure to have his queens purely mated. Those who purchase queens fertilized in September will be most likely to get pure queens for breeding purposes, and should by all means purchase them during the above month. The latter part of September is certainly the best time, for many reasons, to introduce valuable queens.

We are now preparing our bees for winter. All upward ventilation is checked, and no draughts of air will be permitted to pass through the cluster.

Some of the colonies will be placed in the cellar about the first of December or sooner, if old Prob. predicts a cold wave for New England about that time. Last fall the bees were put in the bee-house about the 27th of November and during the next six weeks the weather was as fine and warm as in October, with the exception of one cold day, and we wished many times they were on the summer stands.

The bees wintered finely, but

would have been in much better condition in the spring, if they had been left on the summer stands, at least six weeks longer.

"As one extreme follows another," I predict that the weather will be cold during the early part of the winter, and warm during the latter part, which would be the reverse from what it was last winter.

The colonies should be prepared for winter early in October, whether they are to be wintered in the cellar, bee-house or on the summer stands; a certain amount of preparation is necessary and it should be attended to early, so that the bees need not be disturbed when they have once formed the winter cluster.

We have wintered bees in tenement hives and may use some of them the coming winter. If possible, we will explain this hive in this number with directions for using it.

Early in July we sowed several acres of buckwheat for the bees. Our experience with this article was rather limited, but we saw in the *Am. Bee Journal* at the time we sowed it, "July is the time to sow buckwheat;" so we ploughed rather more than three acres of land and had that number of acres of buckwheat in full bloom for over six weeks. It may do to sow buckwheat about the tenth of July in some sections, but here in New England we have learned by this year's experience that it should be sown as early as June 15, possibly by June 10 to be of any benefit to our bees.

About the tenth of July the honey flow ceased, and that is just when the buckwheat should have been coming into bloom. Just as it did come into bloom, cool nights came on, and, although we had three full acres all white with flowers, the bees were not in the least benefited by it. Had the seed been put in one month earlier, the bees would have had about four weeks of fine weather to work upon it.

During the past season we have reared Syrian queens from homebred and imported mothers. The results as regards size and markings are precisely the same. We have found that young Syrian queens are much smaller and darker than the other races. In fact, all Syrian queens reared from imported mothers have striped, yellow and black bands. The yellow rings are very bright, and the dark ones very black. The worker bees of this race are not so uniformly marked as the Italians. Many of the bees show but one narrow, yellow band; nevertheless the young queens are very uniformly marked, all striped, and not a clear black one is produced. An Italian queen, whose workers would be as poorly marked as Syrian workers, would produce nearly all black queens. This clearly indicates that the Syrian bees are a distinct race, while the Italians are not. We have no race of bees that seem so strong *on the wing* as the Syrians.

We consider the Syrians the most hardy of the new races. Many of our customers have called for Italians crossed or mated to the Syrians. They are the most desirable hybrids we have.

CANADIAN DEPARTMENT.

R. H. HOLTERMAN, EDITOR.

THE season has varied very much in different parts of Canada. Along the shores of Lake Erie we have the best reports; one lady (where about fifty colonies are kept in the immediate vicinity) reports three increased to eight, 750 lbs. extracted and 50 lbs. comb honey, the remaining more

than doubled and procured over 100 lbs. per colony. Another, having two hundred colonies, reports season not up to the average. In fact bees were weak in the spring and unless they received special attention, colonies were not in good condition to take advantage of clover; basswood, although it promised well, was rich in bloom, appeared to die off and in most localities bees only worked one or two days upon it; thistle only yielded fairly. Regarding fall flowers so far our own experience is brighter than it has been for the last four years. It has been impossible to remove top stories except one or two; some have half stories others whole upper stories, all extracted immediately before fall flowers came in and now full of honey, brood and bees. There is little present demand for wax, nice white, A1 extracted honey sold for a short time in localities for nine cents per pound. It is safe to say the supply of honey is not greater than the previous year, whilst the demand steadily increases.

Our leading fairs and exhibitions have closed and we have had the pleasure of interviewing many of our most prominent beekeepers. The reports for the season are conflicting and run from 250 lbs. per colony down to 50 lbs. The locality may have something to do with this, but much depends upon the condition bees were in when the honey season commenced. Year by year it becomes more evident that much of the difference in reports of yields are due to the vast difference there is in the strength of our colonies, especially such a season as the past.

The average yield, among men with a full comprehension of their business, was between eighty and ninety pounds of extracted honey and seventy-five per cent increase per colony. Extracted honey may be bought from men anxious to sell, at eight to ten cents, and little doubt that by Christmas it will be up to eleven and twelve and one-half cents.

The honey crop this year is little, if any, larger than the season of 1884 and the demand greater. Supply dealers have done a poor business generally; the mortality being so great that very little has been sold in such lines as hives, honey extractors, honey knives and brood foundation; the demand was fair for sections, section foundation, honey cans and labels.

With bees there has been a great tendency to increase and should the winter prove favorable and an ordinary amount of care be exercised in preparing, packing and storing away for winter, the loss of the previous winter should be fully made up.

The bees have done well on fall flowers and have not yet finished in some localities. Yesterday (September 28), I left a friend's apiary while his bees were gathering actively on golden rod and aster. They had gained several pounds per colony since the 18th inst.; and upon entering the yard the night before, we could hear that contented hum which spoke well of their success during the day.

The London Fair had a fine display of honey as to quantity (little behind Toronto), but the quality was generally inferior. Toronto was fair as to both and took the lead as to quantity. Hamilton, however, had the finest display as to quality that it has ever been our fortune to set eyes upon; for texture it could not be excelled, color was very fine, flavor hardly up to the two other properties but very good.

The Ontario Beekeepers' Convention could hardly be regarded as a success this year. The meetings were announced far too late for the first week of the Toronto Industrial Exhibition; it had always been the second and many would not come in until then; meetings were finally called the second week also, and thus, in a measure, all were a failure.

Brantford, Ont.

CORRESPONDENCE.

VISIT TO THE NEW ENGLAND FAIR.

MR. EDITOR:

Having just returned from a visit to the New England fair, and Eastern Maine State Fair at Bangor, Me., I thought I would write you a short letter on what I saw at the N. E. fair.

Owing to the fact that there were no premiums offered for exhibition of bees or honey, the show of apiarian exhibits was somewhat limited, but what it lacked in quantity it excelled in quality. The first thing which met the eye of the visitor upon entering the hall was the large and varied display of Mr. W. H. Norton of No. Madison, Me. In a prominent place, where their movements could be readily observed by the delighted visitors, were shown two full colonies of bees in observatory hives: one colony of finely marked Italians, and one of Holy Land or Syrian bees.

Near by was shown a large honey extractor containing combs, showing the manner of extracting honey, and judging from the number of questions with which Mr. N. was assailed, was something entirely new to most of the people present.

Mr. Norton also had on exhibition the different styles of hives with both crosswise and lengthwise frames; the various kinds of surplus cases; honey in all kinds of marketable styles; boxes containing combs in all the different stages of construction and to add to these, the indispensable smoker, a new and fine foundation mill (Pelham make); beautiful foundation both heavy and light; nice section cartoons or paper boxes for retailing comb honey, and, in fact, nearly every thing appertaining to modern bee culture, and you have an idea of the fine display made by Mr. N.

Mr. Norton, although a young man, is evidently an enthusiast on the subject of apiculture, and was kept constantly busy answering questions from the steady stream of visitors which crowded around the apiarian department.

Mr. Norton certainly deserves the thanks of the beekeepers of New England for the successful display made by him, in the face of the fact that there were no premiums to be awarded.

In conversation with him, he informed me that the season had been a very good one in his locality, and in answer to our question, Which do you consider the best race of bees, all things considered? he replied promptly, I think the Holy Lands are decidedly the best, and when their good qualities are more fully understood by the people, they will at once take the front rank as honey producers. Adjoining the collection of Mr. N., was shown a large and splendid pyramid of comb honey, which was produced by Mr. W. M. Chapman of Dixmont Centre, Me., whose snowy combs called forth tokens of admiration from all observers.

Mr. C. bespoke for his brother apiarists a much larger collection of "bee fixings" at the coming Maine State fair at Lewiston, as liberal premiums were to be offered there, thereby encouraging people to do their best toward educating and interesting the masses in the science of beekeeping, which is fast becoming one of the recognized industries of the United States.

LUTHER E. BURNHAM.

Essex, Mass., Sept. 9, 1885.

ST. JOSEPH (MO.) EXPOSITION.

The St. Joseph Exposition for 1885 was a grand success. We had the largest and finest display in the Bee Department we have ever had. The Board gave us all the space we wanted, and everyone had a chance to display his goods to the best advantage. Too much cannot be said

in praise of the officers of the Exposition for the liberal treatment which bee men have received at their hands.

About $300 in premiums was offered in this department, and the list was well represented.

Mr. Armstrong of Jerseyville, Ill., took first premium on best colony of Italian bees, comb honey, wax, his crown hive, and a number of other things.

The St. Joseph Apiary carried off the first premium on extracted honey, case for display of honey on sale; Syrian, Cyprian and Carniolan bees, and several small premiums.

Mr. Newman's Extractor took the first over a "Novice." The Berlin Fruit Box Co. got first on Sections. Mr. Muth got first on his "Perfection" Smoker in competition with one that has been before the public for some time. The "Glass Front" Bee Veil had no trouble in winning the first premium. Mr. Alley's Drone Trap was honored with a diploma.

There were two large displays of apicultural literature, on which Mr. Parker was awarded first, and the St. Joseph Apiary second premium.

The superintendent of the department had a large photograph of Langstroth framed, and set up in a conspicuous place, accompanied by a slip of paper on which was written, "Rev. L. L. Langstroth, inventor of the movable frame hive." Many stopped to look at his genial face, and, we trust, went away with the impression that in a certain sense, he might be called a benefactor of his race.

We hope that next year your readers will remember the St. Joseph Exposition and come with their bees, honey, etc., and help to swell our display. We are confident that they will not regret it if they do.

E. T. Abbott.

St. Joseph, Mo., Sept. 8, 1885.

NOTES FROM AUSTRALIA.

My dear Mr. Locke:

By the Californian mail which arrived yesterday, I received a pleasant surprise in the shape of a beautifully bound copy of the "American Apiculturist," Volumes 1 and 2. I have noticed Mr. Cutting's remarks in reference to the excellence of the binding and can fully endorse all he says. It so happened that the monthly meeting of our Beekeepers' Association was held last night, and I was able to lay the volume on the table for inspection by the members, who were much pleased with it. They tried to convince me that you intended the book for the use of the Association. I am now under a debt of gratitude to you, which I will endeavor to pay, by getting new subscribers to the "American Apiculturist." This is all the more easy since yours is certainly the best of the bee papers.

I have also received two copies of the "Beekeepers' Pocket Companion," and have started circulating them among the members of our Association.

Our short winter of three months is over:—almond trees, which are planted largely around Adelaide, are white with blossoms presenting a beautiful appearance and offering good forage for bees. The honey season has therefore started.

Wishing you success in your new business, and trusting that the "Apiculturist" will long continue to flourish, believe me

Yours truly,

A. E. Bonney.

Engineer-in-Chief's Office,
Adelaide, Aug. 7, 1885.

NOTES AND QUERIES.

—The honey crop of California will not be over one quarter of that of 1884.

—The honey crop of Vermont for 1885 is considerably above the average for that state and of a finer quality than common. One apiarist has raised 22 tons.

—More honey is raised in Aroostook Co., Maine, than all the New England States together save the state of Vermont.

—Not far from 5000 queen bees are reared and shipped from the state of Mass. each year. While Vermont and Maine are noted for their fine honey, Mass. beekeepers have the credit of rearing the finest queens in the world.

—There is not a township in the United States that does not furnish sufficient flora to support from one to one hundred colonies of bees.

—Of the animals most detested and most likely to be attacked by bees are the horse and dog. Cows and oxen are seldom injured by bees. Sheep are sometimes attacked, but this is not the case unless they are confined very near an apiary.

—Now is the time to make all preparations for wintering bees. Get them packed so that they need not be disturbed when the weather is too cool for bees to fly. We need not give any special directions here for wintering bees, as they have been given in the journals many times and are found in all treatises upon bees. All should understand them by this time and act accordingly. If your colonies are supplied with plenty of wholesome food, and properly packed for winter there will be no loss of bees.

The careless beekeeper will certainly have reason to complain that his bees die in winter, or that they do not do well. Such a person will not prepare his colonies properly nor at the right time for winter. The result is loss of many bees during winter.

— Mr. J. E. Pond, jr., who has so kindly agreed to take charge of the department entitled "Instructions to Beginners," has been compelled by circumstances beyond his control, to defer his introductory article until November. We are certain that our readers, with us, are anxiously waiting to hear from him, and are more than ready to welcome any instructions that may be given.

—While in Boston a few days since, we had a chat with a prominent dealer in honey. His supply comes mostly from Vermont, and is mainly stored in two pound sections. He says the day for such large packages will soon be "gone by," as the small dealers or grocery men demand one pound sections, and the day we saw the dealer, he could have sold one-half ton of honey, had it been in one pound packages. Beekeepers, he says, must adopt the smaller sections and take a lower price for their honey. [Our readers will understand that this dealer refers to the New England honey market.]

—We would invite all practical beekeepers to send us short articles relating to bee culture. Remember that short articles are the ones that always receive attention. Short, pithy, and interesting articles are always welcome. Of course there are questions which require many words, and a short article would hardly do them justice; nevertheless, they are the ones that produce the best effect, and are the most satisfying to the general reader.

—Honey is said to be a luxury. If so, it is one of the most wholesome and cheapest luxuries offered for sale. When pure honey can be purchased at from 12 to 15 cents per pound, it certainly cannot be considered dear. If more honey and less oleomargarine were eaten, the health of the people would be better.

—Will those of our patrons who have purchased queens from the Apiculturist Bee Farm, and introduced them successfully, give us their method for doing so, in as few words as possible for publication in the Apiculturist?

—We notice that some grocerymen deal in the so-called "pure" honey put up in tumblers. The only pure honey about it may be found in the small piece of comb, placed in each package. Another way people are swindled is by the sale of the "pure fruit jellies," put up in such packages as is the vile stuff called honey. These various jellies do not contain one particle of fruit. In fact, everything in their composition is artificial and sooner or later will destroy the health of those who use them. Goods of the above kind are bought for sick people, and by others who cannot afford to purchase honey in larger quantities. Is it not about time dealers discontinued the practice of imposing upon and defrauding their customers, by such methods? It is very hard to convince people that they are being defrauded by purchasing such goods.

—Now is the time weak colonies should be united. The best and safest method for uniting bees is as follows: Remove the queens from the colonies to be united. Confine the bees in the hives three days, use wire cloth so as to give plenty of ventilation. Keep the hives in a cool, dark place. At the end of three days, and just before sunset, brush all the bees from the combs of one of the hives in front of the other, and as they run in, let the best queen, of the two removed, go in with them. If the bees are fed a small amount of syrup flavored with the essence of peppermint, or given a little tobacco smoke the day they are united, the operation will be a success beyond doubt.

—We regret to announce to the readers of the "Apiculturist" that Mr. Locke is suffering with temporary indisposition, caused by overwork; but we hope that he will soon be able to resume his editorial duties.

The friends of the "Api," who have so kindly favored us with articles for its columns, are requested to continue the same, all of which will be duly appreciated and acknowledged.

—The following list of Premiums, awarded at Iowa State fair, was sent to us by Mr. Wm. Kimble.

Messrs. B. Menbencher & Ayers, premium.

On comb honey,	
White clover, first premium,	5.00
On extracted honey,	
White clover, first p.,	5.00
On best display of extracted honey, first p.,	25.00
On beeswax, first,	5.00

A. J. Norris premium.

On Italian bees, second p.,	2.00
On Cyprian bees, first p.,	5.00
On Holyland bees, second p.,	2.00
On Black German, first p.,	5.00
On best and largest display of different races of bees, first p.,	20.00
On largest number of queen cells on one frame, first p.,	5.00
On extracted honey, White clover, second p.,	2.00
On extracted honey, Fall flowers, first p.,	5.00
On best and largest display of comb honey, second p.,	10.00
On beeswax, second p.,	2.00

Pumphrey Bros., Premium.

On comb honey, white clover, second p.,	2.00
On display of comb honey, second p.,	10.00

Wm. Kimble, Premium.

Best Italian bees, first p.,	5.00
On Cyprian bees, second p.,	2.00
On Holyland bees, first p.,	5.00

On Black German bees, second p., 2.00
On best and largest display of different races of bees, second p., 10.00
On comb honey, fall flowers, first p., 5.00
On best and largest display of comb honey, first p., 25.00
On largest number of queen cells on one frame, second p., 2.00

QUESTIONS AND ANSWERS.

FRIEND LOCKE:

I would like to get all there is to know on "Feeding back Extracted Honey." Can you not get some who best knows to write an article covering all the ground as to whether it will pay, and the relative merits of top, side and bottom feeders, and whether it is best to feed in midsummer during the honey dearth, or late in the fall months? I saw in an old Beekeepers' Exchange reference to an article by Nellis on the subject. If it is good, and up with the times, will you reproduce it?

SAMUEL CUSHMAN.

Pawtucket, R. I.

QUESTIONS BY SAMUEL CUSHMAN.

1. In a given amount of comb honey made without foundation, what is the proportion of wax and honey?

2. Which is the more profitable to feed for *comb building*, granulated sugar or thick extracted honey at the same price?

3. Are practical producers generally using the reversible frame?

4. Is it not generally accepted by all, that full sheets of foundation in sections are the correct thing? that it pays better than starters or V-shaped sheets?

5. Is the plan of feeding (when honey is scarce), to build out foundation in sections for another season, generally followed by experienced and extensive beekeepers.

6. In feeding candied honey will it be best to liquefy it? For spring stimulation would not candied honey be better than dry sugar which is advocated for inside feeding?

7. Who are the largest producers of comb honey, also of extracted honey? Their names, according to relative amount produced, and their addresses?

ANSWERS BY J. E. POND, JR.

1. This question is a curious sort of conundrum, and any answer would be problematical to say the least. I don't know that any positive tests have been made of any one with a view to determining the matter, and I am sure that it would be very difficult, if not positively impossible to make such tests. In the matter of beekeeping, it is desirous to "prove all things, and hold fast to that which is good;" how this old saying applies to the question at issue, I can't precisely see. It requires from fifteen to twenty pounds of honey to make one pound of comb is, I think, the admitted idea of beekeepers generally, and that it is economy to use foundation is also generally admitted; further than this all answers must be wholly theoretical, and how proofs can be had by tests is something I can't just see. After all, however, of what value would a correct answer be to the fraternity? The only question of importance is to my mind, whether the use of foundation is economical at present prices or not? and that is, the testimony we have is certainly strong in that direction.

2. In my own experience granulated sugar at the same price as honey is the cheaper; that is to say, that one lb. of sugar will be converted into more comb, *than one lb. of honey.*

3. I have made inquiries sufficient to enable me to answer fully, but my impression is, that they are not. For myself, I can only say, that I have not found them so particularly advantageous as at first I thought they would prove. This is one of those matters that sound big in theory, but pan out rather light in practice.

4. I think the majority so agree. Some think differently. In fact, friend Doolittle takes the ground that it is economy not to use foundation at all. As for myself, I should use it at a *profit if I paid* 1.00 *per lb. for it.*

5. I do not think it is, neither do I think it practical. It would require, however, a large amount of correspondence to ascertain the facts, and the answers to this question may determine the matter. I trust that interest enough in this matter will be taken to give data sufficient to prove it one way or the other.

6. 1. Yes, certainly. 2. For stimulation I should feed liquefied honey diluted, and should dilute candied honey, in order to give the water required for raising brood.

7. I don't know.

ANSWERS BY E. E. HASTY.

1. I am under the impression that the proportion of wax to honey varies greatly, but have made few experiments. Two years ago I melted up a lot of poor section honey (built on narrow starters of foundation) and the lot yielded 30 lbs. of honey and 1½ lbs. of wax.

2. Do not think *profitable* is the word for forced comb-building. Probably the honey would be a little less unprofitable.

3. Think not.

4. Quite a few dissent, I think, myself among them. I might perhaps agree if in a different location.

5. Think not.

6. Liquefy candied honey if for stimulating purposes; but leave it solid if preventing starvation is the only object. It will be better than dry sugar. Very weak or torpid bees must not be trusted with solid stores.

7. Am not posted as to the amounts produced by the largest apiarists.

Richards, O.

ANSWERS BY A. J. COOK.

1. The amount of wax is slight and varies with the depth of cell. Sometimes nearly double as much honey is put into a cell that will be put in at another time.

2. I think the granulated sugar would pay the best, as it has less water than the honey.

3. Not yet; the frame is new and new things, even when good, come into use slowly. It is a good thing and must grow rapidly in favor.

4. I can not answer; but know one who thinks so.

5. I think not.

6. I should never feed either sugar or honey in the crystallized state.

7. I presume Mr. Muth could give a good answer to this question.

Lansing, Mich.

ANSWERS BY H. ALLEY.

1. It is said that it requires twenty lbs. of honey to produce one pound of wax. I think this may be correct. But who can tell without guessing?

2. Neither sugar nor honey is profitable to feed for any such purpose.

The experienced beekeeper never gives *thick* honey to his bees. It should be diluted with water, so that the bees can "work" it.

3. We guess not.

4. So far as my experience goes the V-shaped starter is better than a "full sheet" for surplus boxes. Years ago, when we put boxes on the hives having combs in them, made the previous year, we noticed that the bees hesitated a long time before working in those boxes which were full of comb; while those having but a small piece in the box were filled and "work-down" first.

5. Don't think it is. It would pay well, but is not practised.

6. Candied honey will do to feed in the spring for stimulating and brood rearing purposes, and it is better than dry sugar. Bees cannot use the latter unless water is supplied at same time.

7. I think we shall have to read the back numbers of the bee journals before we can make a correct reply to this question.

Wenham, Mass.

ANSWERS BY L. C. ROOT.

1. About one lb. of wax and fifty lbs. of honey.

2. Honey. I would be glad if sugar had never been mentioned in connection with bees in any way.

Many people look upon us with suspicion if we use it in any way.

3. No.

4. Yes, especially if honey is to be shipped long distances, and sold in markets where the appearance is a prime condition.

For home use I would say use no foundation at all.

5. No.

6. I would liquefy both sugar and honey, and consider it far preferable.

7. J. E. and J. Hetherington of Cherry Valley, N. Y., are the largest producers of fine comb honey in best market shape in the world. I think I am correct in this statement. I am not certain who is the largest producer of extracted.

Mohawk, N. Y.

ANSWERS BY G. W. DEMAREE.

1. It is a difficult matter to answer this question accurately, because bees build their combs thicker and heavier at one time than they do at another, and for this cause any experiments we may make are liable to vary in results. From the tests I have made I would say that the proportion of wax and honey, as to weight, is one pound of the former to fourteen of the latter.

2. Honey gives the best results.

3. No, sir, not "generally" so, by a great deal.

4. It is not accepted by *all* honey producers that full sheets of founda-

tions in sections is the correct way, but a large majority of the most successful honey producers believe and know that it pays to use full sheets in the sections.

5. I think not, for the reason that it will never pay to feed solely to induce comb building, for any purpose Every attempt that I have made to have foundation drawn out by feeding solely for that purpose, has resulted in loss to me.

6. When feeding granulated honey for winter stores, I "cut" it with hot water, reducing it to the consistency of thin new honey. When feeding in the spring I prefer granulated honey just as it is to any other food.

7. If I were to undertake to answer this question I should miss some of the largest producers and they would feel slighted. Please have me excused.

Christiansburg, Ky.

QUESTIONS BY A BEEKEEPER.

ED. AM. APICULTURIST:

DEAR SIR,

Will you please answer the following, as many are advising to extracting honey in fall and replace with sugar syrup.

1. What proportion of the sugar is lost in capping, or how many pounds of sugar will be required to produce ten pounds of capped stores?

2. How long will it take to cap same, and should the syrup be fed as fast as possible, or a small portion, $\frac{1}{4}$ or $\frac{1}{3}$ at a time?

By answering, you will oblige

A BEEKEEPER.

Fowler, Ohio, July 29, 1885.

ANSWERS BY J. E. POND, JR.

1. This question is one of those indeterminiate and indeterminable problems that are constantly arising in every-day practice. It would require very nice and accurate tests to solve the question, if solvable at all. Again, the conditions are so constantly changing, and so seldom alike in different hives, that an apparent solution in one instance would be "teetotally" disproved in another. I would be willing to pay a handsome sum myself, for a positively correct answer that would apply with certainty to every case.

2. The first part of this question is problematical also, and the time would vary in every instance, owing to the fact that no two colonies are ever found existing under and in the same conditions. To the second part, I will say most positively, if the object is to get the largest amount of syrup possible capped over in the least possible time, it should be fed as rapidly as the bees can take it down and store it. If the feeding is being done for stimulation it should be fed regularly but slowly.

LETTER BOX.

Dun Glen Apiary,
Chillicothe, Ross Co., Ohio.

MY DEAR APICULTURIST:

We in this section have again made a failure in our honey crop. No white clover. Apple bloom short. Locust bloom shortened four days. Catnip and sweet clover our only bloom through the entire summer. Then rain, rain, rain, and cool nights and bad days. Just enough honey flow to keep up a moderate quantity of brood. Blacks have done badly; Italians a little better; Syrians better still. If we do not have a good flow of honey this fall, many colonies will perish. Much feeding will have to be done to bring through the winter.

F. W. BLACKFORD.

Lake Village, Ark.

DEAR SIR:

Received queens Sept. 2, all O. K. Introduced them successfully, and they are laying now, Sept. 5. I am very much pleased with the queens as well as the cages, which I think are superior to any I have yet seen. You will hear from me again.

Very truly yours,

H. RAMUS.

Mt. Vernon, N. Y., Sept. 4, 1885.

SILAS M. LOCKE & CO.

GENTLEMEN:

The goods came safely the day after I wrote you concerning them and I thought I acknowledged receipt of them. I am much pleased with the new edition of Alley's Handy Book and the bound volume of the Apiculturist is something that I think every beekeeper should have. I started to select some of the most interesting articles but they are all so interesting and useful that I gave it up and intend to read right through from the beginning to end. There certainly is more useful information in the two books than I have ever received for so small a sum.

Very truly,

PHILIP H. LUCAS.

S. M. LOCKE & Co.:

I might report my experience in bee-keeping.

I bought June 26, 1885, four colonies of black bees in old box hives, and on July 11 a very light colony of Italians in movable comb hive 12 × 12.

When transferring, I got 100 lbs. of strained honey, after which 75 lbs. of surplus section comb honey from three colonies (no surplus has been taken this year in this section of any account).

I now have nine *full colonies*, five more 4-frame *nuclei* (2 bees' and brood and 2 honey) with young laying queens, three with virgin queens and four more with queens not hatched, making in all 21.

The 12 4-frame nucleus, I put three in one hive (three five frame departments).

I am the greenest of beginners, as I never handled a bee in my life, and had never read anything of their management until this last spring.

If I come out alive next spring, I want to Italianize all my bees and had intended to try the cross with the Holy Land queen I had from you.

Respectfully,

I. S. HUCKINS.

Poughkeepsie, Sept. 10, 1885.

S. M. LOCKE & Co.:

The Syrian queen arrived safely, on the 8th, I am well pleased with her. I placed her over the frames as directed, with a small colony of black bees, whose queen is about three years old. I went out to take in the hive to find the old queen, and found them in a high state of excitement, and a crowd of Holy Land bees at the entrance. Being called away, I returned in half an hour, and found the old queen dead on the ground before the hive.

This was quite surprising to me, as I did not know that bees would kill their own queen to make room for a stranger, and one also of another race. I took out the caged queen and found them feeding her, but fixed the cage as directed with sugar in the opening, and they are now happy and peaceful. I am very grateful to the bees for giving her the "happy despatch," for she is one that I have looked for twice in vain. I thought it remarkable the bees in the entrance of the hive were all Holy Land bees, as I have but few workers of that race. They seemed very much interested; knowing seemingly the old queen to be black, and the new queen of their race.

I had given a favorable report of the other queen received of you, true so far as it went, but disastrous in the end. This old black queen I had looked for in vain during one whole afternoon (you see what a novice I am) and in order to keep my queen safe and happy, I put her in the small fertilizing hive, with young bees, brood and honey, confining them two or three days; this hive I placed in an open window in the second story, but on going to them one morning, found the whole hive in possession of large black *ants*. I saw one ant the evening before; so you see it was the work of one night.

I am thankful for the very plain and valuable directions given with the last queen, as I shall now know how to keep queens in future, safely. I was ashamed to report this before it seemed so careless.

Respectfully yours,

S. E. WILEY.

Wadestown, W. Va., Aug. 22, 1885.

MR. S. M. LOCKE.

DEAR SIR: The honey season is over here and one of the poorest that was ever known in this section of country. Bees almost failed to swarm and those that did secure a few swarms failed to store enough honey to winter them. The season has been so dry the white clover almost failed to bloom and it is our principal honey plant here. I shall renew my subscription and secure one of your queens the first of next month.

C. L. EAKIN.

Pottstown, Sept. 14, 1885.

MESSRS. S. M. LOCKE & Co.:

Sent you a postal on the 12th inst. in the morning, and at noon I received a queen which had been already safely introduced. The other queen I got could do no better. I have got queens from different breeders, but none to compare with yours.

WM. H. DEWITT.

Baltimore, July 2, 1885.

FRIEND LOCKE:

Your beautiful book Vols. I and II received and contents noted. It is very handsomely bound and I have no hesitancy in pronouncing it fully up to any bee journal published.

H. WINSINGER.

The American Apiculturist.

A Journal deboted to Scientific and Practical Beekeeping.

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BEE CULTURE IN THE SOUTH.

By G. W. Demaree.

Judging from the enthusiasm of Kentucky beekeepers, as exhibited at our state convention at Covington, Ky., on the twenty-third and twenty-fourth days of Sept., 1885, it will take more than one bad season to effect the enterprise in our State.

Information gathered from nearly every part of the state shows that the season was unfavorable all over the state, and but a light crop of surplus honey was secured. Bees, however, are in good condition for wintering as far as the bees themselves are concerned. For some cause not clear to me, the queens have laid later than usual and hence the supply of young bees will add to the colonies the chances of a longer lease of life. I am not much in favor of late breeding; at any rate I shall have the opportunity to test the matter pretty thoroughly this winter.

Our convention was honored with the presence of the father of modern apiculture, Rev. L. L. Langstroth. Mr. Langstroth is seventy-five years old and when in ordinary health, possessed a strong and vigorous mind and still takes a deep interest in bees, hives and implements used in the apiary. His address to the convention, explaining the steps which led to his invention of the movable frame, was exceedingly interesting to all persons present. Mr. Langstroth took an active part in the discussion of all important subjects before the convention.

The display of honey and apicultural implements was very fine. Some finely bred bees were shown in observatory hives, also some imported Italian bees and queens. A number of new devices and implements on exhibition were objects of great interest. An examination of these would convince any one that Kentucky beekeepers are fully abreast with the times.

Mr. Chas. F. Muth, in whom we

claim an interest, though he resides across the line in the Queen City, aided the convention not a little by his presence and experience, as well as by his display of honey extractors, wax extractors, smokers, honey, glass jars, etc., etc.

All together the convention was pleasant and profitable. It was generally conceded that it would require considerable feeding to get all our bees safely through the coming winter.

Bees have gathered but very little honey during the fall months. The chief cause of failure in summer and fall seems to have been unfavorable weather for honey secretion; north and east winds mean no honey with us. When the flowers were dried up the weather was good, and when the flowers were plentiful, the weather was rough.

Christiansburg, Ky.

LOCALITY TO BE CONSIDERED IN THE MANAGEMENT OF BEES.

By D. D. Marsh.

All writings upon beekeeping should have in mind the difference between the various localities of our land; and the novice, fired with enthusiasm at the reports he reads from some great honey locality, might as well understand at the outset that what is done in one place cannot always be done in another.

The great supply business of modern apiarian fixtures has been greatly augmented by throwing out false inducements which have no regard for the locality of their customers. Such an indiscriminate promise of success must of necessity provide a column of "blasted hopes" for the wail of the unsuccessful.

Nothing is more evident, and at the same time more astonishing, than the great difference between the honey yields of different localities. Not only states differ, but neighboring parts of the same state differ. One man reports, "I never have had a greater harvest;" and another man but a few miles distant from him reports, "My bees have done scarcely anything." My interest in bees was originally kindled by the pleasant fictions of Mrs. Lizzie Cotton's circular, though I did not fall into her clutches. I soon learned by experience that exaggerated hopes founded on such misrepresentations could not be realized. Different localities need entirely different management according to climate and favoring surroundings. The debated question whether black bees or Italians are better depends somewhat, I think, on the locality and peculiarities of the apiary. My hives stand on the only land I have at my disposal, a low and damp soil in a hollow surrounded by shady trees and buildings. I have found thus far, during eight years, that black bees have made comb honey far better than Italians.

After buying bees of farmers and Italianizing them with high hopes of the yellow beauties, I have gone back again to black bees because, with the

same treatment, they have made nearly all my comb honey. I cannot but think that, had I a dryer and more favorable position for my hives, the Italians would make a better showing. As I am situated, only bees which enter boxes readily, and stay in them during cool nights, promise success. I can readily believe the reports of others in different localities concerning the boxworking tendencies of their Italians. The swarming tendency of bees is largely dependent on the position of the apiary. I know a man who has his bees in a dense thicket of trees and grape vines, where no sun shines in, and the bees have hard work to find a path out. He gets hardly any new swarms, while if he would set his hives out in the sun in a dry and warm place, he would have new swarms enough.

The raising of the hives from the ground has a great deal to do, I think, with success in getting comb honey. Most of the bee-books direct that the hive be placed directly on the ground or on narrow strips a few inches from the ground.

A captivating authority on bees advises that sawdust be banked about the hive; a moisture-holding and damp material when placed on damp soil. A friend of mine sent for his first hive of bees, and, following his A, B and C literally, placed the hive flat on the ground near a bog-hole, and under the shade of a too friendly tree. Is there any evidence that bees were designed to be ground insects? Where do they make their home in their wild state, in holes in the ground or in high trees? Do not bees know what they are about when they invariably alight high and dry in the air, and select as their home the hollow of a tree away from the ground's dampness? I have noticed that farmers, who have box-hives roaring hot with bees early in spring, have their hives up on a plank two feet at least from the ground.

I believe the place for hives on ordinary soils is up away from the ground. I noticed in Mr. Alley's apiary that his bees were off of the ground a foot or more. For several years I kept my hives on the ground where the damp chill of night would settle round them, and under the shade of trees at that. My premises being limited, that seemed the only place where I could have them. A neighbor of mine had his hives on a dry knoll, just such a place as a man would choose on which to erect a tent, sunny and airy. He beat me right along every year in section honey; sometimes he would get twenty-five pounds a hive when mine would make scarcely any. A year ago I built a wooden horse about four feet high, in a sunny and airy spot of my yard and in the dryest part of it, and put my hives on it. They wintered well there and came out strong this spring in double-wall hives with chaff cushions. This season I took off one hundred two-pound sections from the six hives I had on the high horse which was far exceeding anything I had been able to do before; for, in addition to the disadvantages under which I had labored, our pasturage hereabouts is not a very rich one. My experience has convinced me that hives run for comb honey should be raised away from

the damp ground, though my hives run for extracted honey are only a foot from the ground and have done well. If an apiary is on very dry soil and well elevated, hives may do well enough set on the ground; but even then I should prefer to have them elevated some. The reason for this elevation is, that bees breed up earlier in the spring in dry air and, as they make comb in sections during the night, we should keep them above the damp chill of the ground. The advantages of stimulative feeding in early spring also varies according to locality.

I am situated ten miles from the sea, and during early spring the east wind begins to blow after a sunny forenoon, chilling the bees which have been tempted out by early feeding. My bees have come out the strongest in June when I have kept them as quiet as possible during the spring. The successful beekeeper must study the peculiarities of his own locality and adapt the principles of this fascinating pursuit to his own case.

Georgetown, Mass.

WHY THE BEES DIE.

By Prof. A. J. Cook.

I have many complaints this fall about bees dying. Several of these dead bees have been sent to me by different parties. The bees are small, apparently young, very black; yet a close examination under the microscope shows no organic disturbance. What can the trouble be? I am not sure, but I incline to the opinion that it is a case of chilling. We have had a remarkable year. In mid-summer the season was excellent; honey came in by the gallon. The bees bred very fast, and so the brood-chamber became very full of brood. The last of August the weather came very cold; the cluster of bees must be compacted and so its size reduced. Thus the bees chilled, the brood perished, and young bees just coming from the cells were so chilled, or so pinched with the cold, that they could never straighten out, and so were cast out as unprofitable servants. In some cases I have seen young worker brood and nymphs—pupa—thrown out of the hive in heaps. Many who complain of the small, black, young bees, which seem bereft of vitality, also speak of the heaps of dead larvæ. One young beekeeper supposed he had "foul brood" and came in great haste for me. I found his bees in admirable condition, yet much brood and many pupa and young bees were piled out in front. Yet the bees were still strong and in good condition.

Lansing, Mich.

FEEDING BEES AND FEEDERS.

By P. R. Russell.

No. 1.

Mr. Editor: If I could charge a big gun with all I know about bees and their management, and discharge it full in the face of your numerous readers, it would be altogether

more than they could well assimilate at one dose. I imagine I can see the knowing ones popping their heads above the parapets and laughing in derision. But hold! If I should charge the gun with what I *don't know* about bees, I don't want to be around when it is fired off. I should expect it would be blown to flinders and the cannoneers carried off in baskets.

But we will let the big gun rest for the present and if you are not afraid of the smell of gunpowder, I will proceed to touch off a few harmless squibs. The commissary department first suggests itself to my mind (perfectly natural to an old soldier) so I announce my subject: Feeding Bees and Bee Feeders. By way of reconnoitre I wish to state that, after I returned from the late civil war, being still aggressive, I looked about for other foes to conquer; and soon found them under an apple tree in the shape of two hives of bees, 20,000 strong. As they appeared to have considerable fight in them I arranged with their owner to place them on my territory and to give them the advantage of position. They were placed on the flat roof of the ell where I could make sorties at them through the garret window. Instead of the cast-iron guns I had been using I chose a small tin breech-loader about a foot long, and with armor on I soon began to skirmish around those hives,—but I never caught them asleep; they proved themselves fully worthy of my valor. Indeed, they were perfect little savages. Talk about the hero of Thermopylæ. If Leonidas had had to advance and retreat through a garret window as many times as I did with a cohort of enraged bees after him he would have been a hero indeed.

All that is changed now and those hybrids have given place to civilized Italians, and although we exchange shots occasionally we for the most part get along very amicably.

I have had very fair success with my bees—especially in wintering them.

Although the amount of surplus honey I get is rather small, which I attribute to poor location, still I doubt if any beekeeper in eastern Massachusetts with an apiary of over twenty stands can show a much larger average.

I use the closed end standing frame and prefer it to the hanging frame, having used both. Now to return from this digression to my subject: Feeding Bees and Bee feeders. I have two feeding campaigns in the year, spring and fall. We will begin with the fall. Having performed all preliminary work of uniting all nuclei, removing all surplus boxes, reducing number of brood frames to eight as the maximum number, supplying queens where needed, etc., then by raising the rear end of a hive I can tell to a hard-tack just how much each will need to be fed. If they have twenty-five lbs. of stores, all right; if not, then feed till they have. I make my feed as follows: I place my tin budge barrel (which has a faucet near the bottom and has been used all summer as an uncapping can) on the stove and put therein twenty-five lbs. of granulated sugar and five

quarts of boiling water; stir it well and when it is clear set it aside. I find it is not necessary to boil it. A perfect feeder suitable for use on all occasions has not yet been produced; but the one I like by far the best for fall feeding is simply the common Mason's improved glass top, one and two quart jars.

The way I use them is this. Remove the glass cover and in its place put a perforated tin disc which can be found at any tin shop, screw on the zinc collar and it is held firm. Then I want a half inch thick board, cleated on top to prevent warping, to place over the frames; a hole is sawn in the centre large enough to admit the muzzle of the feeder. Cut a piece of wire cloth five inches square, mould it into the shape of a straw hat. This must just fit into the hole and lack one-eighth inch of being flush with the under side of the board, and a few tacks through the brim will hold it fast. This wire cloth answers the double purpose of supporting the feeder and keeping the bees below when refilling. After a time it will get fouled with propolis, but can be easily cleaned by applying a little heat from a lamp. When all is ready, fill the feeder and invert it over a vessel to save the drops that will fall. Then place it in the hole and the feed will flow no faster than the bees take it. The capacity of the feeder being known makes it easy to estimate the amount being fed. In changing feeders from hive to hive there is no need of a smoker as the bees are confined by the wire cloth.

Lynn, Mass.

BEEKEEPING FOR WOMEN.

By Mrs. Sallie E. Sherman.

Why is it that there are so few beekeepers among women? It certainly cannot be that they are not adapted to the pursuit, for some of our most successful apiarists are women. I am quite sure that it is a much more healthful occupation than sewing on the machine or than following many other occupations that many of our sisters follow for a livelihood. I'll tell you that if more of you would join our ranks and get out of the house where you could breathe the pure fresh air, you would be more healthy and add a good many more dimes to your meagre income, to say nothing of having pure honey upon your own tables of your own raising the whole year round. You would not then have to consider it a luxury too dear to have only occasionally at long intervals. Just think of the thousands, yea, millions of flowers that annually "waste their sweetness on the desert air," for the want of the little busy little bees to gather and store it for the use of man. But if you decide to go into the business, you should undertake it intelligently and with the full determination to make a success of it.

There must be no such thing as "give up" in your composition. If you fail try, try again and keep trying. Only get one, two or at most three colonies to begin with; get a good text book and study it diligently and carefully, and then practise its teachings. Not do like a good lady of

my acquaintance did, wait until your bees get to swarming and then hunt up your bee book to see what to do with them.

There is a great deal to be learned about this busy little insect. I have been working with them now almost constantly for five years, and if it had been fifty instead of five I should still expect to learn. I have gone into the business for a lifetime, be that long or short; and I for one am determined to make a success of it. I am what is called an enthusiast in bee culture. In addition to your text-book you should take a good bee journal. I would suggest the "Apiculturist," that is published at Wenham, Mass., for the small sum of one dollar per annum; you should also get a good smoker, and a bee-veil to protect your face. I never use gloves now, though I did when I first began. Of course, your bees should be in a movable-frame hive. I decidedly prefer one with a movable bottom-board for our hot climate, so that in very hot weather the hive can be raised and thus ventilated from the bottom. I only had one frame melt down through our past hot summer and that was new tender comb and very full of honey. I saw it immediately after it broke and don't think that I lost two tablespoonfuls of honey.

I would suggest that in buying your bees you get pure Italians at the start from some good reliable dealer and thus save you the trouble of Italianizing them, for if you read the bee literature of the day, you will, I am satisfied, decide in favor of the Italians. They show their superiority in a year like this, more plainly than in a real good honey season. I have several of my best Italians that have yielded 150 lbs. per colony this year, while I have a few common natives from which I have not taken a pound of honey.

To prove to you that our vocation is a healthy one, I shall only have to tell you that I weigh fifty pounds more now than when I purchased my one colony of black bees in a gum hive. My health is better than ever before in my life. I am often surprised at my strength. Then, dear sisters, do you wonder at my saying that I am in the business for life? If this interests you, I will try and write again, and tell you of my success as a specialist in bee culture.

Salado, Bell Co., Texas,
Oct. 16, 1885.

THE BEST FRAME.

By Dr. G. L. Tinker.

On page 207 of the "Apiculturist," a friend inquires why I should abandon the Gallup frame for a size $14\frac{3}{8} \times 9\frac{1}{4}$, which I have adopted, after a trial of several styles of deep and of long frames, as my preference. In the production of comb-honey, the selection of a frame has generally had reference to the mode in which the surplus receptacles are applied, and in my case it has been no exception.

After many experiments in wintering, I came to the conclusion that where a brood-chamber was enclosed by chaff, leaf, or sawdust packing, the form and size of the frame, where

the dimensions of the brood-chamber were the same, had nothing whatever to do with the safety of wintering. Doubtless there are those who will disagree with me on this point, but I think that when they have carefully tested the matter as I have done they will give it up. After coming to the above conclusion it was decided to make a frame for my own convenience adapted especially to my new system of comb-honey production. I had abandoned side storing and with that went the Gallup frame, as it did not present enough surplus room on the top of ten frames to correspond with the large amount of brood comb below. There were two other, but minor, objections to it that in themselves would not have warranted the change, but still they are worth noting. The first was the disposition of the bees to attack brace combs between the ends of the frames and hive that is seldom noticed with long frames. This could be overcome by making the space only five-sixteenths of an inch between the end bars and hive, but then there was trouble in getting out the frames, for, in spite of the closest workmanship, it was found impossible to make the frames so true that some of them would not hang too close to the hive at one end or the other, or soon after, from changes in the wood of the frame or hive. The lower end of the frame would then be stuck to the hive with propolis so as to make it very difficult to get out except in the warmest weather. With shallow frames we have never had any trouble of this nature. The other objection was in the distance that the frame had to be lifted to get it out of the hive. The greater facility in lifting out a shallow frame will not be fully realized by any one till they try one by the side of a deep frame.

My objection to a very long frame like the standard Langstroth is the sagging of the top bars. If a bee space is provided (which I no longer use) between the top bars and supers, it should never be more than five-sixteenths nor less than one-fourth of an inch. It is a very common thing to find the top bars of the Langstroth frame sagged one-fourth of an inch; this would give a space of one-half inch in the centre to be filled up, as it never fails to be, with brace combs. We have in use some Simplicity frames made with heavy V-shaped top bars that work very well, but even these will sag a little in time. Now the liability to sag of a top bar sixteen inches long, made V-shaped and solid, as in the Victor frame, is almost nothing as compared with one nineteen and one-fourth inches long as in the Simplicity. But since, with our surplus arrangement, we could apply as many one-pound sections on the shorter frame as on the long one, we could see no advantage in the latter that would warrant us in adopting it. Hence our preference for the size named.

As to the proper depth for producing comb honey, I stated long since, that I believed Father Langstroth had struck the happy medium in the proper depth of his standard frame. In a top-storing hive, if the frames are too deep the bees will not enter the supers readily; if too shallow, the bees will carry a large

amount of pollen into the sections. The point of least objection in the above particulars is at nine and one-eighth inches of depth.

We do not expect ever to see a standard frame adopted in this country. There are too many minds to suit; too many radically different modes of applying supers requiring specially constructed frames ever to think of it. If all beekeepers produced extracted honey, in which production one form and size of frame is no better than another, we should then have hopes; but so long as some of our leading apiarists prefer for comb honey side-storing hives, some top-storing and some both side and top-storing, we shall never agree upon a standard frame. Were I to go back to side- and top-storing hives, I should go back to the Gallup frame or the American, but with an exclusive top-storing hive, which we have fixed upon, we are somewhat pronounced in our preference for a shallow frame.

New Philadelphia, O.,
Oct. 13, 1885.

INVERTIBLE HIVES.

By J. M. Shuck.

When the verdict of this year has been written it will be largely in favor of the invertible principle in the manipulation of bees and thin combs. Those who are now in favor of reversing the brood combs of the hive are simply pioneering the way for greater results than the average beekeeper has deemed possible.

Some one has remarked, with considerable pertness, "that he did not want his brood combs reversed unless they were already wrong side up." The inference here is plain that his frames are always right side up. Such may not be the case.

Apiarists are generally agreed that good management requires the brood frames to be full of brood, in all stages when white clover or the main crop of the season is to be gathered. A colony that is thus able to nurture its thousands, has force adequate to the harvest, and as the brood combs are already full, the surplus case, for either comb or extracted honey, is the only place in which to put it. No close working apiarist wants two or three inches of honey in the tops of his brood combs at this season. The tops of combs thus used are usually store combs, and are only halting places on the way to the storeroom of the hive. When they are in this condition near the beginning of the honey harvest they are "wrong side up" no matter whose they are nor in what hive they are. Invert them, turn them right side up, then those storage cells will be cut down and turned into brood cells; they will become the cradles of thousands of workers instead of loitering places for idlers. They will then become a source of live profit instead of remaining dead capital.

After the enterprising apiarist has manipulated "reversible frames" for a season until he begins to see clearly that he approves them, that they are practical, that he can achieve results with them that he cannot without them, he naturally concludes

that if it is good to turn one frame upside down at a time, it may be profitable to fix them firmly in the hive and invert all at once. If it takes three minutes to open a hive, reverse one frame and close it, the proposition is plain that time is saved by inverting the hive and all the frames in less than three minutes. Besides the saving of time, the combs and brood are not exposed to robbers and danger of chilling the brood which are always present in cool weather.

The ready control of the combs secured in Mr. Langstroth's invention, and the great ease with which they could be handled, have led perhaps a majority of beekeepers to excesses in manipulation. No hive from which profit is expected should be opened "just to see what they are doing" or to show a visitor a beautiful queen. Still practical honey producers know that manipulation of the right sort stimulates the colony and causes the brood to spread, other conditions being favorable. This class of "handling" may all be done by changing the position of the hive, set it on end to-day, and in a few days place it on its bottom or top and then again on the other end. Any of these positions may be given the invertible hive in a minute and the bees scarcely disturbed, and it can be done at night or at other times when hives cannot be conveniently opened.

Inversion of the combs ensures their strength, they become fastened solid to the frame all around, brood is reared all over alike and the cocoons strengthen and toughen every cell. Combs, if they break down, always part where no brood has been raised. Combs for storage of honey to be extracted are more serviceable after having given forth a few generations of bees. One disadvantage may be named, they are more liable to the ravages of the moth worm.

One curious incident connected with the inversion of brood combs this season may be mentioned here.

A colony was rendered queenless and the hive inverted five days afterwards. An examination the next day showed all queen cells destroyed. Nine similar trials were made with the same results. It is supposed that the change in position of the queen cells at that stage caused the disgusted bees to tear them down.

Marked advantages accrue to the producer of comb honey by using invertible cases and inverting them when the sections are two-thirds filled, or strong enough to stand alone. The sections will then be filled full and plump all around, if the honey flow is sufficient for their completion.

Des Moines, Ia.

HINTS FOR BEGINNERS.

By J. E. Pond.

In accepting the charge of the department for beginners in bee culture, I am actuated solely by a desire to make plain some of the points that to myself were matters of serious import when I first began keeping bees some twenty years ago. At that time there were but two or

three works on bee culture, and those related most entirely to old methods. Frames were used to some extent, but not by those who did as now, give the world the benefit of their growing experience. Not that they would not have done so had they the opportunity, but bee culture had not attained any rank among the industries of the world, and but few journals were published in its interest, and those that were published did not reach the masses, as they were only known to those of experience.

Bearing in mind the difficulties that beset me at every point in my endeavors to learn, I shall be well repaid for my efforts if I am enabled to aid a few only (I trust I shall aid many) in the most fascinating pursuit in which I have ever engaged. It will be my aim to state facts only, and those gathered from my own experience, leaving theories to be discussed by those who have a greater taste for them than I have at the present time.

I do not propose to undertake to fill the position of a text book, as there are a number now published that can be perused with great profit. I shall endeavor simply to give such seasonable hints from month to month, as will enable those who have a real desire to improve, to gain a practical knowledge of methods that will be of use and profit to them. It is now too late to think of purchasing bees, and the prospective beekeeper can make no better use of his time than to procure two or three of the best works on apiculture and study them carefully during the coming winter, leaving the matter of purchases till spring opens, and all nature shows its gladness at seeing the cold dreary reign of winter broken. Among the works published, I will advise "Langstroth on the Hive and Honey Bee," "Quinby's Work" revised by L. C. Root, and "Alley's Handy Book" for beekeepers. From a careful study of all these a correct knowledge of principles can be gained, and when their contents are well digested the student may follow them with "Cook's Manual."

Bee culture can only be learned by study and practice. The principles should first be fully learned, and then their application can be practically made by actual labor in the apiary.

In my next article I shall treat of the hive and methods of manipulation.

EDITORIAL.

In the last issue of the "Api," we stated that the season just past had been generally speaking a most prosperous one for the beekeepers. Judging from the reports in our exchanges, there have been some localities where but little honey has been stored. Now this is not the case as a rule. In some parts of the country the season has been too wet, while in other places it has been too dry. Then again, where large crops of honey were made in 1884, the crop for 1885 has been a light one. As we have before stated, all this may be expected, as sure as one season follows another. A fruitful year is

sure to be followed by a season of scarcity. It is a well known fact to pomologists and fruit-growers generally, that fruit trees will yield a given amount of fruit for a few years, then the tree must rest and recuperate, and in due time, with proper care, will again bear abundantly. So it is with the honey-producing plants. They yield largely one season, and little or none the following year. Again, the honey-producing flora is governed by the state of the atmosphere. With us here in New England, the flowers secrete no nectar when the wind is east of north or south. But when the wind comes from the northwest or west, the bees work smartly. The largest quantities of honey are gathered when the wind is about southwest, and the atmosphere somewhat muggy.

A new disease has appeared in some apiaries the past season. As no investigation of its origin has been made, its cause is as yet obscure. One of the principal symptoms of this disease is this: the worker bees may be seen crawling about the entrance of the hive, and on the alighting-board and act the same as bees that have been chilled. In dissecting a bee, the sac is found full of what appears to be newly gathered honey.

The bees do not die off rapidly, but the colony gradually decreases in numbers, and the hive after a while is depopulated. The healthy bees continue to do the routine work of the hive, gather pollen and remove the dead and dying bees.

A description of a somewhat similar disease may be found in "*A B C of Bee Culture*," by A. I. Root. Until a better name can be found for it we shall call it "bee-cholera." If any reader of the "Api" has any colonies that show symptoms of this malady, he will oblige us by sending a report to us, also giving his opinion of its cause and results of any experiments made to find a remedy or to discover the origin of the disease. Should it prove to be "cholera," perhaps with properly conducted experiments, a remedy may be found. On the other hand, if it be a disease transmitted to the worker progeny by the queen, the remedy is an easy and simple one. If it be a disease peculiar only to the Italians, the remedy is also easily applied, as we now have other races equal, if not superior, to the once universally favorite yellow bee.

"In time of peace prepare for war." Winter is a time of peace with the beekeeper. The thoughtful and practical apiarist makes every preparation during the cold months to secure the prospective honey harvest the coming season. His new hives are "put up," painted and made ready for immediate use the moment some one cries out "the bees are swarming."

The fixtures and apparatus for securing in sections the surplus honey are made ready to place upon the hives as soon as the bees are ready to receive and work in them. It is not best, perhaps, to place foundation in the frames, or sections, during the early part of the winter, but one should arrange so that but little time will be required for such work when the honey harvest begins.

NEW OBSERVATIONS ON THE NATURAL HISTORY OF BEES.

By Francis Huber.

(Continued from p. 229, Vol. III.)

The sequel of our experiments, made with every possible precaution, appears demonstrative, the uniform sterility of queens in hives wanting males, and in those where they are confined along with them, the departure of these queens from the hives, and the very conspicuous evidence of impregnation, with which they return, are proofs against which no objections can stand; but we do not despair of being able next spring to obtain the complement of this proof, by seizing the female at the very moment of her union.

Naturalists always have been extremely embarrassed to account for the numbers of males in most hives, and which seem only a burden to the community since they fulfil no function, but we now begin to discern the object of nature in multiplying them to such an extent, as fecundation cannot be accomplished within; and as the queen is obliged to traverse the expanse of the atmosphere, it is requisite the males should be numerous, that she may have the chance of meeting some one of them. Were only two or three in each hive there would be little probability of their departure at the same instant with their queen, or that they would meet in their excursions, and most of the females would thus remain sterile.[1]

But why has nature prohibited sexual union within the hives? This is a secret still unknown to us. It is possible, however, that some favorable circumstance may enable us to penetrate it in the course of our observations. Various conjectures may be formed: but at this day we require facts, and reject gratuitous suppositions. It should be remembered, that bees do not form the sole republic among insects presenting a similar phenomenon; female ants are also obliged to leave the ant-hills previous to fecundation.[2]

I cannot request, sir, that you will communicate those reflections which your genius will excite concerning the facts I have related.

This is a favor to which I am not yet entitled. But as new experiments unquestionably will occur to you, whether on the impregnation of the queen or on other points, may I solicit you to suggest them? They shall be executed with all possible care, and I shall esteem this mark of friendship and interest as the most flattering encouragement that the continuance of my labors can receive.

Pregny, August 13, 1789.

You have surprised me most agreeably, sir, with your interesting discovery of the impregnation of the queen bee. It was a fortunate conjecture that she left the hive to be fecundated; and your method of ascertaining the fact was extremely judicious and well adapted to the object. Let me remind you, that male and female ants unite in the air; and that after impregnation the females return to the anthills to deposit their eggs. It would be necessary to seize the instant when the drone unites with the female. But how remote from the power of the observer are the means of ascertaining their commerce in the air.

[1] Remarkable irregularity subsists in the number of males, compared with the other inhabitants of a hive. Swammerdam found 693 along with 8194 workers. Previous to the swarming of a large hive Reaumur counted 700 among 26,416 common bees, and one queen. In another containing only 2900 workers, he found 693 males. He computed 50,000 cells in the former, of which 20,000 were full of brood. About 2520 cells were appropriated for breeding males, and about half of them were occupied by larvæ and nymphs. Thus, including the 700 in the perfect state he observes, that this hive would be provided with about 2000 males.

[2] The males and females of ants are winged insects; the former perish sometime after their amours, and the females lose their wings a certain period after impregnation.

[*To be continued.*]

EXPERIMENTAL BEE FARM NOTES.

There is so little doing at the present time in the apiary, that we have but few notes to make. The colonies are ready for winter quarters, and at the proper time they will be placed in the cellar, under our new factory. The situation is such that we can take the bees into the cellar without climbing over any steps or a long flight of stairs. When we get ready to put the bees under cover for winter, we can do all the work in about one hour's time. The ventilators are so arranged that the fresh air will enter at the bottom and the foul air will pass out through the tall chimney erected to take the smoke from the boiler.

Our colonies consist of Cyprians, Syrians, Albinos, Carniolans and Italians. All are about in the same condition as to stores and bees. We shall note from time to time which of the races are wintering the best. While such experiments may prove nothing, or be of any practical value, yet it will be interesting to know which of the races will best stand the confinement they will have to endure for four long months.

When the hives are placed in the cellar, the back ends will be elevated four inches higher than the fronts.

We do this so that the bees as they die may roll out at the entrance, which is the full length of the hive and about one-half an inch high. Should the dead bees lodge under the frames, as they most always do in winter, it will be an easy matter, where the hives are thus prepared, to remove any accumulation of dirt from under the combs, by using a small stick for the purpose. We are quite sure it can be done by a careful person without scarcely disturbing the bees.

While the bees are in the cellar very little ventilation will be given. We consider that a large entrance furnishes about all the ventilation a strong colony will need. A small aperture might be left at the top of the hives, without in the least endangering the health of the colony. There cannot be much air pass through a hive while the bees are in the cellar, and out of the way of all wind. The temperature of the bee-room will be kept as near 45° as is possible to do. So often as once a month the dead bees will be swept up and removed from the cellar, so that the atmosphere will be kept sweet and pure.

Experience has proved that the Italians are the poorest nurse bees of any race we have. The Cyprians and many colonies of our Syrians were reared for the express purpose of cell-building another year. The two latter races rear the best queens of any bees we have used for the purpose. We will say as to the disposition of the Cyprians, that we have but one colony that are real "tigers." Unless this colony is handled in a scientific manner the operator will get badly punished. We have used this particular colony for no other purpose than cell-building. They are fine nurse bees, and so well adapted for such work, that this is the only reason they are permitted to exist in our apiary. We have other colonies of Cyprians that are as docile and as easy to handle as the Italians.

We are favored by a large number of visitors. All who come are desirous to see the different races of bees; so this fall we have added to our stock a fine imported Carniolan queen. Possibly we may rear some queens from her another year, to supply the demand for the few ordered. When beekeepers have further tested these bees the sale of them will be small. The second or

third generation from an imported Carniolan mother, unless crossed by the Italians, will resemble the blacks so nearly that only the expert can detect the difference.

It is our aim to rear at the "Api" Bee Farm only queens of the best races. We consider the Italians and Syrians, and their crosses the best, for all purposes. The Syrians are the smarter, more energetic and hardier of the two races. It is said that the Cyprian when mated to the Carniolan produce a fine strain of bees. The latter race are very gentle in disposition, and when crossed with the former transmit that good quality to their worker progeny, thus producing a very desirable strain of bees.

CORRESPONDENCE.

WHAT A WOMAN CAN DO WITH BEES.

Bees in my locality wintered well where they had been properly cared for, but owing to the excessive rains and long-continued cool weather in the spring they consumed what winter stores were left over in brood-rearing without being able to gather more; consequently much of the brood was torn down and destroyed, and the drones were all killed. Yet, despite all this management, many of the little workers died of sheer starvation, and that, too, with thousands of flowers in full bloom all around. It is just as essential that the weather be propitious for the secretion of honey as that there should be flowers in which the nectar may secrete. The hives being thus depopulated is it any wonder that the honey crop is a partial failure? This also explains why there have been so few swarms this season. Every colony that has Italian blood in it speaks for itself, when you come to take off your surplus honey in a seaton like this. I have taken over 100 pounds per colony from several of my best Italians, while from a few common stocks that I have, I have not taken a single pound. This is also the case with a neighbor living just across the street from me. My bees up to date have averaged thirty pounds per colony. I had forty-eight colonies to begin with this spring; have an increase of only ten. Thus you will see that I have taken 1440 pounds of honey. I have this day (July 21) fixed two hives for queen-rearing and am determined not to be satisfied or stop trying until every bee in my yard is pure Italian.

I want to say to everybody that is interested in bee culture, or that is likely or liable to be stung, never pull the sting out, as by doing so, because of the peculiar construction or formation of the sting, you push the virus or poison into the flesh, thus causing great pain; whereas, if you will scrape the sting out with a knife you also scrape the poison out, thus relieving the pain at once: I then blow a little warm smoke on the place from a smoker, and the trouble is ended.

This morning (July 22), while going to a neighbor's house I passed through a few acres of cotton, upon which I found hundreds of bees busily at work. All of these were either pure Italian or hybrids; not a single native bee could I see. After reaching my neighbors I looked through her four colonies of native bees, and not a pound of surplus honey was to be found. There have only been a few pounds taken from one colony this season, and, judging from appearances, there will not be any more.

MRS. SALLIE E. SHERMAN.

[By request of Mrs. Sherman we give place to the above. It shows what a woman can do at keeping bees, and also, the superiority of the Italian bees. Our lady readers will be pleased to know that Mrs. Sherman has promised to become a regular correspondent to the "American Apiculturist".]

EXCHANGES.

A FEW FACTS CONCERNING BEES-WAX, BY C. H. LAKE.—To quote from Prof. Liebig's great work on "Animal Chemistry:" "The bees," says this learned writer, "consume twenty pounds of honey to make one pound of wax, and every ounce of comb after constructed would hold one pound of honey."

Many other prominent writers compute the consumption of honey at twenty-five pounds to every pound of comb built.

Wax is not gathered like pollen or propolis. The bees have to manufacture it, at great cost, both to themselves and their owners.

Wax is manufactured in the bodies of the bees, as milk is in the body of the cow; and with bees it is both a secretion and excretion. In collecting honey, bees carry it to their hives in sacs; if it passes into their stomachs or their intestinal canals, it passes into the juices of their bodies, and scales of wax ooze out or are excreted from the under side of their bellies.

Dr. Liebig says "it takes thirty-eight hours to convert honey into wax," that is to say, that the laminæ or thin scales of wax do not appear on the bellies of the bees till thirty-eight hours after the honey has been taken into their intestines."

This surely cannot be correct. If a swarm of bees is forced from an old hive full of old combs, and placed in an empty hive, comb-building will commence in about six hours—in warm weather.

Both the weather and the warmth of the hive have a great deal to do with comb-building. The making or secreting of wax is voluntary on the part of the bees, and this is another of the mysteries that has never been fathomed. Bees do not secrete wax to any extent when their hives are filled with comb.

Wax will differ in color, if honey of different kinds is consumed in its manufacture.

As honey from one kind of plant differs in taste from that of another kind of plant so wax differs in color.

In the covers or lids of brood cells there will be noticed the fact that they are always the color of the cells they cover, the cells of dark comb will have dark lids, and white comb, white lids.

The learned Prof. also makes another assertion that is incorrect. He says "combs are never built in a hive unless the bees have the presence or prospect of a queen."

I have frequently put large swarms of bees into empty hives and set the swarm where the old hive stood, catching and killing the queen at the time of hiving, and have had by this method some of the finest drone combs built I ever saw or possessed. "Wax-making and comb-building is a very interesting and important question in the workings of the bee hive, and but little is with certainty known about it." So says an able writer on the subject.

Wax is a very inflammable substance, containing over 80 per cent of carbon. I have found that a pound of virgin worker comb contains over 50,000 cells, which fact shows what wonderful frugality is displayed by these model architects in comb-building. Quite a book could be written on wax and its uses. Did it ever occur to you, reader, that all the beautiful flowers ornamenting so many of our parlor tables, making home cheerful, were the product of these little busy bees? Immense quantities are used for this purpose, and also in doll-making. As many of your readers, Mr. Editor, may be unacquainted with the immense traffic carried on in wax, perhaps a few facts from the census reports of the past may be interesting.

The census of 1840 gives the value of the product of the United States at $628,000, or about 2,000,000

pounds. That for 1850, "wax and honey," nearly 15,000,000 pounds, worth nearly $3,000,000. That for 1860, for wax alone at 1,357,000 pounds. The exports in 1859 and '60 were 362,000 pounds, worth $135,000. In 1861, 238,300 pounds were exported from New York alone. In 1860 nearly five-sixths of the exports were to Brazil, England and France. Foreign countries also send large quantities upon the market, the Portuguese province probably taking the lead, by annually sending to Europe nearly 50,000,000 pounds. Beeswax is produced in every country in the temperate and torrid zones.—*The Baltimore List.*

CANADIAN DEPARTMENT.

R. H. HOLTERMAN, EDITOR.

Canadian beekeepers are organizing for the purpose of having a monster display of honey at the Colonial and Indian Exhibition to be held in London next season. A display is desired of such magnitude and so rich in quality that it will attract universal attention and not without an object.

For some time we have felt the want of a larger market and we have acted the part of paralytics; we felt the want, knew that our remedy has lain in Europe but, as individuals, we have felt powerless to put forth any effectual efforts to open it. Now we have before us the opportunity of sending our honey, free of charge, and probably some one to take care of it, and it is to be hoped no one will lose the opportunity of doing all in their power to make the enterprise a success.

Once let us secure a foothold in England and Germany with our honey and we can defy these small, ignorant honey-raisers who have done so much in the past to injure our market. If we cannot secure a fair remuneration here, we ship, and the result will be an important one. A more fixed market price, therefore, less danger in handling. Employment for an unlimited number of colonies thereby increasing the wealth of Canada: directly, by the production of honey and bees, indirectly, by an increased yield of clover seed, fruits of all kinds, etc., wherever additional bees are kept.

CONVENTION NOTES.

St. Joseph, Mo., Sept. 29, 1885.

In answer to a call of a committee the beekeepers of this section came together on the 24th inst. at 2 P. M., and elected a temporary chairman and secretary, and then adjourned until next day at 2 P. M. The enclosed clipping from the St. Joseph *Gazette* will explain the result of that meeting.

The adjourned meeting of the Bee Keepers was called to order at the county court room at 2.30 P. M. A Constitution was adopted and the association named "The St. Joseph Inter-State Beekeepers' Association." The election of officers for the permanent organization resulted as follows: President, Ernst Schuman, Breckenridge, Mo.; vice-presidents, D. G. Parker and Robert Corbet; secretary, E. T. Abbott, superintendent of St. Joseph apiary; treasurer, Dr. G. D. Ellingwood, St. Joseph. The following persons paid the annual fee of $1.00 and became members of the association:

E. J. Abbott,	L. G. Buvis,
T. B. Nichol,	John Stewart,
G. B. McArthur,	Rev. A. F. Abbott,
F. G. Hopkins,	James A. Matney,
D. G. Parker,	E. Eastman,
J. D. Ellingwood,	Ernst Schuman.

After the election of officers there was some interesting discussion of various questions relating to bee culture, and the meeting adjourned to meet on the second Tuesday in April, 1886. All persons interested in bees are invited to see the secretary and become members of the association and receive a copy of the constitution.

This new society represents a growing and important industry and should receive the hearty support of our citizens.

E. T. ABBOTT, *Secretary.*

Belmont, Ont., Can., Oct. 29, 1885.

Mr. W. Z. Hutchinson writes me that he will undertake to secure reduced rates over all railways leading to Detroit at time of N. A. B. A.

Come, friends, let us have a big time: the more go, the better rates, I suppose.

S. T. PETTIT, *Vice Pres. for Ont. branch N. A. B. A.*

The North American Beekeepers' Association will meet in Detroit, on December 8, 9 and 10. Every practical apiarist should make an effort to attend and give his rich valuable experience, by taking part in the discussions of the various subjects and questions brought before the convention. The novice and inexperienced should by all means attend, as he will be likely to gather more information from the old veterans in a few days, than by a whole year's experience with a few colonies. The hotel accommodations are ample, and at reduced rates, and with the railroad fare at about one-half the regular prices, it should be sufficient to induce an unusually large attendance. Mr. S. M. Locke will attend, provided his health will permit.

NOTES AND QUERIES.

—Several beekeepers have written to the *American Bee Journal* concerning the new bee disease of which mention is made on another page.

W. S. S. writes thus:

What is wrong with my bees? The strongest colony that I have is losing bees very fast. Early in the morning there are in the hive from fifty to two hundred old bees dead and dying. I examined it to-day, but could find nothing wrong. It had four combs of brood in all stages, from the egg to capped brood.

W. Z. Hutchinson, Prof. Cook and James Heddon reply as follows:

It may be nothing except the bees dying of old age.—W. Z. HUTCHINSON.

Most beekeepers write me that the affected bees seem young, and are black from being bald.—A. J. COOK.

It is nothing strange that a colony should lose that number of bees daily. Just why they do not go off to die, I do not know. Perhaps cool weather is the cause. I do not apprehend anything serious.—JAMES HEDDON.

W. B. T. writes:

What ails the bees? I have thirty three colonies in good condition, and gathering honey in abundance from buckwheat, Spanish-needle and golden-rod. But one of them is affected with a malady which suggests poison; but if that were the case other colonies would be affected. The badly affected bees I should think would number 2,000. They are constantly cleaning themselves by rubbing their bodies, legs and wings, and turning on their sides; they will not run from smoke. Their abdomens are shining, and the black portions are intensely so; they are shrunken and pointed. They are taken from the hive in a string or path extending six feet from the hive. The first indication was about a quart of dead bees that suggested robbing. The weather has been wet and cool one week of the past two. They have a fine queen, but she is not laying to the extent that the others are. They also have preserved their drones. What ails them?

To this Mr. Heddon replies as follows:

I would guess that this colony had found some liquid sweets in bulk, and were robbing.

By the above it will be seen that there is no mistake about a new bee disease. So far as we are able to learn, this new malady is not contagious, and there is little cause for alarm. Nevertheless, "as an ounce of preventive is better than a pound of cure," we advise the removal of all infected colonies, to at least one mile from any apiary.

The season is now so far advanced that no investigation can be made to discover the cause. It is our opin-

ion that every diseased colony will die before another spring, and if the combs are destroyed, and the hives properly cleansed, it may never appear again. Unless it reappears we would advise no one to experiment with it. Some writers have expressed the opinion that the bees are merely chilled. Would the bees in some colonies die from cold while others are at work gathering honey? We saw one infected colony dying at the rate of about fifty bees each day, while the healthy bees in the same hive were working smartly.[1]

—A writer in *Scribner's Monthly* gives a very interesting account of comb-building. "When a swarm of bees is about to leave its old home and seek another one, each bee fills itself with honey. After entering their home the gorged bees suspend themselves in festoons hanging from the top of the hive. They hang motionless for about twenty-four hours. During this time the honey has been digested and converted into a peculiar animal oil, which collects itself in scales or laminæ beneath the abdominal rings. This is the wax. One of the workers, called the founder, then draws from its own body, by means of its clawed foot the scales of wax, and crumbles and works with its mouth and mandibles, till it becomes pliable, and it issues from the mouth in a long narrow ribbon, made white and soft by an admixture of saliva from the tongue. Meanwhile the other bees are making ready their material in the same way. On the ceiling of the hive an inverted solid arch of wax is built, and from this the first foundation cells are excavated, all the subsequent ones being built up and around these which are usually three in number. The size and shape of the cell are determined by its future use, but all comb is formed of two sheets of cells placed back to back, the partition walls of the two sheets always alternating with one another. If the cells are intended for brood, twenty-five cells of worker and sixteen of drone go to the square inch." Von Berlepsch, a celebrated German apiarist, declares "that he has known cases in which a swarm have built three hundred square inches of comb in a single night."

—For a short time the "Apiculturist" will be sent to any address, three months, on receipt of 25 cents in postage stamps, or five copies, three months, for $1.00.

Please call the attention of your brother beekeepers to this most liberal offer.

—We should be pleased to receive reports from all those who keep bees, whether encouraging or otherwise. If you have conducted any experiments the past season, and they have proved successful and practical, please report the result of them for publication in the "Api". Don't feel that you are not competent to write an article for publication, but send us a plain statement of facts, and they will prove both valuable and acceptable. Please send in your articles and thus help make one of the most interesting bee journals published.

—Mr. A. E. Bonney of Adelaide, South Australia, has favored us with a copy of the *South Australian Advertiser* containing the doings of Parliament regarding the matter of setting apart the Island of Kangaroo for the purpose of establishing an apiary, from which pure-bred Italian queens may be had. To show the

[1] Since the above was put in type we have seen the result of an experiment we tried for a friend upon two colonies that were badly diseased. We raised the honey-boards and threw a handful of fine salt over the frames and combs, and then dashed about one-half a pint of water over all to moisten the salt. In a few weeks, or after all the diseased bees had died, all traces of the disease had disappeared. It really seemed to us that the bees were suffering for something of the kind and so we tried the experiment. Will others try the same and report the results?

interest taken in bee culture we give the remarks of Mr. Downer, a member who favored a bill excluding black bees from the above island.

Mr. H. E. Downer, in moving the second reading, said this measure was of considerable importance to those interested in bee culture and to the residents of Kangaroo Island. The Chamber of Manufactures was so impressed with the advisability of introducing and keeping pure the breed known as the Italian or Ligurian bee that, at their request, and that of some other people, his honorable colleague tabled a motion in the matter, and when he had accepted a position in the Government the task devolved on him (Mr. Downer) of moving the second reading of the Bill. He was assured by those who had paid great attention to the matter that the Ligurian had great advantages over the ordinary black bee. It was a distinct species which for many centuries had been cultivated in Italy, and was celebrated for its great power of collecting honey, and for its quietness and docility. The drawback to having both sorts of bees living in the same district was that they mixed very readily, and the result was a combination, which, although an improvement on the black bee, yet had several disadvantages which rendered a fusion of the two races extremely undesirable. While the Ligurian bee was very amiable and quiet in its disposition, the hybrids showed a high degree of combativeness, and attacked any person or animal who approached their hive. The Ligurians gathered more honey, and what was a great advantage in a new country, they had larger families than the others. The question of the desirability of introducing the Ligurian bee being settled, the next point was to find some locality suited to their culture, and where the race might be kept pure. Such a place was Kangaroo Island, both by its distance from the mainland and the trees and plants which grew there, and whose flowers would form excellent food for the bees. Already a good deal was done in the way of importing bees from Italy, and inasmuch as they could not be carried a longer voyage than about thirty days without considerable loss, Kangaroo Island would form a useful depot for the culture of the bee, whence the other Australian colonies and New Zealand could draw their supplies of pure stock. Mr. Bonney, who was a well-known authority on the subject, had supplied him with some notes, in which he coincided with these views. The only other question to consider was whether the exclusion of the black bee from the island would be an injustice to any of the residents. As a member for the district he would be the last to do this, and the result of enquiries made by himself and others was that the only black bees they had been able to trace was one swarm, which had since been removed through the action of the Chamber of Manufactures, which supplied a swarm of Ligurians to the owner. He therefore believed that at present there were no black bees on the island. The first clause prohibited the breeding or importation on the island of any but Ligurian bees. The second clause gave power to a police officer, on the authority of a justice of the peace, to enter on any place where black bees are supposed to be and have them removed. Clause three imposed a penalty of not less than £10 or more than £50, with a term of imprisonment of not more than a month, for introducing other bees. On reconsideration he would ask the House in committee to strike out the penalty of not less than £10, because it was a high fine for a first offence, and he would ask them to do the same with regard to the power to commit to prison.

The Hon. T. Playford, speaking as one who had grown and sold honey and wax twenty years ago, could say that what we wanted was a superior sort of bee. The Ligurian was superior in size and honey-storing qualities, but when introduced into a country among the black bees the two mixed, and the hybrid was a very vicious bee indeed. What we further wanted was a spot where the Ligurian bee could be kept pure, and whence supplies of the stock might be drawn to the mainland. Kangaroo Island was a very good place for the experiment, as it was understood that it was almost, if not entirely, free from the common black bee.

QUESTIONS AND ANSWERS.

QUESTIONS BY A READER.

1. What advantages has a deep frame over a shallow one regarding wintering, breeding and honey storing?

2. In your opinion is not a plain, simply constructed hive the best for the average beekeeper?

3. Is not a hive that will take but

8 L-frames and one that has a cap sufficiently deep to cover two sets of boxes when "tiered up" as good a hive as is required, when properly managed, to make beekeeping a success?

ANSWERS BY WILL M. KELLOGG.

1. As regards the deep or shallow frame for wintering, my experience has been so strongly marked, and always so in favor of the deeper frame, that to me, there is no question which is the better. Heat naturally rises, and spreads latterly only when it can't go up. In a deep frame, a very much larger portion of the honey is *above* the cluster, where the heat, rising and remaining, enables the bees the more readily to go up to get a fresh supply of food. In the shallow L. frame there is scarcely ever over two inches of honey above the brood (I have used them by the hundred hives) and this supply soon becomes exhausted, when the bees have to move latterly to the ends of the combs for food. In a warm cellar, or in a southern climate, this objection would not hold good; but the warm cellar will not protect stocks when removed to their summer stands, and we often have sharp cold weather after we have taken our bees out. As to breeding and honey storing, again I can see no advantage in a long, shallow frame. In my experience, and I have had twenty years of it, the square, or oblong, frame puts the brood in the best possible shape, *i. e.*, in a circle, for the bees to care for, the queen to deposit her eggs, and the beekeeper to handle the frames.

I have had very much less trouble with queens entering boxes where I used the deeper frame, and I had over two hundred L. hives to experiment with in a good rich honey flow. This, to me, is plain evidence, of the queen's desire to extend her brood nest upward to complete the circle.

I have always had little to do with theory; hard practical facts are what I write of, and in this case I say that the claim of increased surplus from using a shallow hive, has never been sustained in the least particle while using both kinds of hive in the same apiary in large quantities enough to thoroughly test it. My claim for a deep frame over a shallow one is this in brief. More compact form of brood and hive, frames and hives easier handled, food easier got at in winter, less brood in upper stories, and stronger combs.

2. In my opinion "a plain simply-constructed hive is the best," for *any* beekeeper, be he average or expert. All we need in a hive is a simple box of four sides and a bottom, with rabbets cut in the top edges of the front and back to receive a set of simple frames made of seven-eighths stuff all around. This, with a simple cap to protect the surplus arrangement will get as nice honey, and as much of it as a crimson and gold finished palace of a hive.

3. I have never been an advocate of small hives. From one that is fifteen inches square by thirteen inches deep, inside measure, I can get just as much honey, as can be got from one that is one-third smaller. Then, too, the small hive invariably bothers more by excessive swarming. I can tier up the larger hive easily. I consider a 10-frame better in every way than an 8-frame, especially of the L. pattern. I do not like a deep cap deep enough to cover two sets of sections, but prefer one depth with extra rims to raise one or two tiers higher.

ANSWERS BY PROF. A. J. COOK.

1. I question if a shallow frame, when rightly managed, is not as safe for wintering as a deep one. For comb honey it is certainly better. We wish honey above in sections not in deep frames below.

2. Yes, decidedly, and for all others.

3. I think so; but after a fair trial I much prefer the Heddon style and would omit the cap. Then we can tier up to our liking, and the hive is very *simple and excellent.*

Lansing, Mich.

ANSWERS BY J. E. POND, JR.

1. None whatever. On the contrary, a frame of depth of the regular L. 9½ inches, I deem to be the safer for wintering, as good as any for breeding, and far superior to all for honey storing; and this after an experience of 19 years, during which time I have given all styles and depths a fair trial.

2. Yes, by all means, and the plainer and simpler the better. The form and size form the chief requisites of a perfect hive.

3. Success can no doubt be achieved with an 8-frame L. hive. The advantages gained by the use of a 10 frame are such that I advise that size even if but eight frames are used.

Foxboro, Mass.

ANSWERS BY JOHN H. MARTIN.

1. If bees are properly prepared for winter I don't see as the shape of the frame makes any material difference.

For breeding, a frame 11 inches deep, 12 to 14 in length placed in the hive crosswise of the entrance, has given us the best results. The bees can be crowded upon few frames, heat retained and the back portion of the hive used for feeding. For honey storing, it depends upon what you are running bees for, extracted or comb honey. For extracted honey one frame is as good as another; with the exception that a long shallow or a very large frame is awkward to handle. For obtaining box honey a shallow frame with a large surface has perhaps a slight advantage.

2. Yes, and also for the expert.

3. No. The 8 frames will do, but provide more room for tiering up. For ordinary seasons perhaps two sets of boxes are enough but we sometimes have an extraordinary season. Shall the beekeeper be ready for it or will he be caught with a hive without surplus room? It is a safe plan to provide plenty of room up stairs: there will be times when you will need it.

ANSWERS BY REV. D. D. MARSH.

1. A deep frame permits a winter cluster to form within the centre of combs, not exposing the outer edge in any direction. Place their honey above when it retains the heat, is the secret of the farmer's *early* swarms from box hives.

It favors breeding by encouraging a *few* bee spaces between large patches of brood, rather than many spaces to be filled by bees between many small areas of brood. It is not so favorable to storing in boxes, because Nature's "box" is the upper part of a deep comb itself, and a box top of that is too far aloft. A medium depth I think the best for storing.

2. The plainer and simpler the better; just brood-box, sections and cap. Nature's hive is just a hollow tree.

3. I believe from experience that our 8 L. frame hive is preferable for section honey. The section clamp should be made in halves: put one on and get the bees at work, then put on the other, then tier up.

Georgetown, Mass.

ANSWERS BY E. E. HASTY.

1. For wintering, my experience is that the shallow frame has the advantage. Some years the deeper frame makes the better show of surplus, but I do not regard the matter as settled. For breeding in cold weather a square frame prevents waste of heat. In warm weather there is no very great difference I think.

2. No complicated hive has yet come out which is to be recommended for general use.

3. A two story 8-frame Langstroth hive ought to succeed. I prefer, however to have the hive hold ten frames and contract to seven by the use of dummies or loafers.

Richards, O.

ANSWERS BY L. C. ROOT.

1. It is a fact not to be disputed that if during early spring our bees are to make the greatest possible advancement in brood-rearing, the warmth generated by the bees must be economized to the very extreme. If this be true, the advantage of the deep frame is so apparent, that for this purpose we need not argue its superiority. I have proven for a certainty that bees reach their stores more readily in a deep frame, than in a shallow long frame, and that, side by side, they winter more successfully in the former.

The size of frame that will insure best results in wintering and brood rearing, thereby securing a good working force at the earliest possible date, is the best for honey storing. Surplus combs or boxes can be arranged for storing honey, no matter what the size of the frame may be. To those who differ with me in these opinions, I ask this question:

If we were keeping bees in bad hives which we desired to winter well, and from which we desired to secure early swarms, who would think of constructing hives, seventeen inches from front to rear, fifteen inches wide and eight inches deep inside measure, rather than twelve inches square and fourteen inches deep.

2. Yes.

3. If you mean by L. frame, the shallow frame with a hive so constructed that there is a space on all sides and between the frames, I answer, no.

If you mean a properly constructed hive as to size and form of frame, and for securing box honey only, I answer, yes.

Mohawk, N. Y.

ANSWER TO QUESTION BY SAMUEL CUSHMAN IN OCT. NO., BY HENRY ALLEY.

Our correspondent inquires regarding the question of feeding back honey to induce bees to finish out incomplete sections. This reminds me of the experience I had and the experiments I made several years ago in order to get some unfinished sections filled with honey.

To do this I fed several colonies very liberally with the best honey slightly diluted with water. I had no trouble in getting the bees to take away all the honey given them. Although I fed them with nice syrup for a long time, not one particle of it was placed in the unfinished sections. The reason why the bees would not do as I desired is well known to all experienced apiarists, though it did not occur to me just at that time. The fact that bees will not mix the different kinds of honey was why they would not finish out the uncapped cells. Instead of working in the sections, the brood-combs were filled so solid that it was necessary to use the extractor, in order to give room for the queen to deposit eggs, and keep up the supply of brood.

In my opinion it will not pay to "feed back," and so far as I know, no one has ever made it a success. If a supply of honey could be had, the same as the bees are storing in the section, just at the time the flowers are giving out, it it might do to "feed back", but even in that case I doubt the expediency. Such feeding should be done at night while the bees are still gathering some honey. When the harvest is ended, feed only in the daytime. The feeder I used on such an occasion was a common tin pan, one that would hold about four quarts, the pan was placed in front of the hive, on the ground, and all was covered by a cloth to protect the bees from toads and to retain the warmth. A small opening only was left for the bees to enter the pan from the alighting-board. A strong colony would take away several quarts of syrup during the night.

Wenham, Mass.

QUESTION BY A. E. BONNEY.

In preparing the strips of comb containing eggs for queen-rearing after Alley's method, is there any objection to leaving every third egg only, instead of every other one?

Adelaide, So. Australia.

ANSWER BY H. ALLEY.

A good many years ago, and long before the adoption of our present method of queen-rearing, we conducted many experiments to compel bees to build queen cells in such a way that all could be removed without destroying any. Pieces of comb containing eggs were cut into separate cells. Each individual cell was fastened to the comb or to the underside of a frame, by a mixture of warm beeswax and rosin. A few years ago, some one conceived the idea of placing cells containing eggs upon a stick, and offering them for sale. The idea was so ridiculous that the trade in that line of goods was soon abandoned. After repeated attempts to rear queens by the single cell method and failing each time I gave up the idea, as not one queen so reared was of the least value, the young queens were very small and worthless. I could never account for this very singular freak,—could I rear good queens by such a method I would abandon all others. To reply more directly to the question of Mr. Bonney I will say that the same objection was found to destroying the eggs and leaving the third one for a queen cell. By removing every other cell and following the directions as given in the Handy Book, one will surely rear the finest queens.

QUESTION BY A BEEKEEPER.

What is the cause of the different shades in the marking of the Italian bees? Some are of a dark orange hue and others very light.

ANSWER BY A BEEKEEPER.

We never supposed that the Italian bees were a distinct race. It is supposed by many prominent apiarists that the Italians are a race of hybrids. This fact must account for the different markings and shades in color. The fact that we get the beautiful Albinos, the leather and orange colored Italians all from the same race seems to confirm the supposition that the Italians are a distinct race of bees. Nevertheless, fine yellow queens which produce bees of uniform marking usually duplicate themselves in their queen progeny. But the impurity will crop out occasionally and a black or striped queen will emerge from a cell, while from the adjoining cell would emerge one of the most beautiful queens.

The Italians are the only "race" of bees whose queens will produce worker bees that show strictly pure and uniform markings. The Cyprian, Holyland and Syrian queens produce bees that show from one narrow to three yellow bands. And queens from these races produce very dark or striped royal progeny.

QUESTION BY CHAS. H. SMITH.

Several gentlemen in this place claim that *comb honey* is manufactured in New York and Brooklyn; that the

comb is made by machinery and then filled with glucose or some other cheap substance, and are then capped by means of hot irons, smeared with wax or paraffine, being drawn over them.

Some even claim that they have seen it done.

To me, the idea is simply absurd; but to settle the discussion, will you please give us the benefit of your knowledge on this subject, through the columns of the "Api?"

ANSWER BY A BEEKEEPER.

We have heard the same statement made several times, but were never able to obtain any of the so-called manufactured honey. A young man informed us that honey was so manufactured, as he was employed by parties who dealt in it. As the young man does not know pure from impure honey we suspect he may be mistaken about it. We often go to Boston and when there again will make an effort to find some of the vile stuff.

LETTER BOX.

Arlington Heights, Mass.

DEAR "API."

This has been a very good season with us. Began the year with three colonies, sold two and increased to four and one-half. Have taken thus far 79 lbs. and expect about 25 more. Located as we are on a high hill and most of the nectar being at the foot, it has to be "tugged up." Have no difficulty in disposing of our honey at 20 cents to neighbors.

Shall remember with pleasure our visit to the Experimental Bee Farm and trust it will be a grand success. Enjoy the regular visits of the "Api" very much and think we have a treasure in the bound volumes.

CHAS. G. WHEELOCK.

Roseville, Ill.

DEAR SIRS:

In answer to an article by Mr. Arthur Todd in the June number of your journal I wish to say that beekeeping *is just* the most suitable employment that can be found for sick and weakly women. Why! it just imparts new life to at least one person who for twenty years has kept her bed three-fourths of the time; but who, after giving much of her time both body and mind to the care of the bees, with the help of a hired girl now cares for one large apiary and her husband cares for another and the apiary of which she has the charge proves equally profitable with the other.

Women who are anxious to make money to further the Lord's work should study up beekeeping as through such a course one can accomplish this object.

AN INVALID.

Carversville, Pa.

S. M. LOCKE & CO.:

In August last we had a very heavy freshet in the creek running through our village, and among the losses was my whole apiary of fifteen colonies. The unusually high water was caused by the breaking of dams situated above the village. I recovered ten of the hives, with part of the frames, which were washed about one-half mile from here, and succeeded in saving two colonies, nearly all of the bees being drowned. And strange to say, one of them contained the Italian queen purchased from you about a month previous. I put her with the bees (about two quarts), on four frames of foundation in a new hive, and by feeding have got a pretty good colony. The other hive only washed away a few rods, but the frames were spilled out of the hive. I replaced them early in the morning, on the old stand, and they are doing pretty well. The fermenting honey and pollen from the rest of the recovered hives, soon attracted robbers, and for a few days there was trouble in the camp; at the end of a couple of days, I put on my bee hat, took my smoker and made an examination of the ruins, when I found them all torn to pieces, with the exception of the before mentioned Italian queen, with her few surviving bees who had left the wet combs and clustered in the cap of the hive. I also had about 200 lbs. of comb honey in one and two lb. sections on the hives, which was all lost.

I will cheerfully distribute any circulars or copies of the "Apiculturist," you may see proper to send to my address.

Very respectfully yours,

GEO. E. CLOSSNO.

The American Apiculturist.

A Journal devoted to Scientific and Practical Beekeeping.

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HONEY AND ITS ADULTERATIONS.

BY PROF. H. W. WILEY.

PURE honey is the nectar of flowers passed through the organism of the bee and stored in a comb. Adulterated honey is any compound or preparation known or sold as honey which has not been formed in the manner described. Chemically considered, therefore, pure honey consists of the substances gathered by the bee from flowers, subjected to such modifications as they may undergo in the insect laboratory through which they pass.

The saccharine exudation of flowers consists of a mixture of various sugars, containing, in the form of pollen, a small quantity of nitrogenous matter. The exact number and kind of sugars in the nectar of flowers has never been determined. Wilson[1] estimated the reducing sugar and sucrose in the nectar of certain flowers. All the sugars however reducing copper were classed as glucose. In general the total quantities of such sugars were greater than the sucrose present. In the flower of the red clover the glucose was three times as much as the sucrose. Since in pure honey there is very little sucrose it follows that the chief change which the nectar undergoes before it appears as honey is in the inversion of sucrose.

During the last year I have had examined by the Division of Chemistry of the Department of Agriculture a large number of honeys some of which were known to be genuine and others of unknown origin.

Following is a description of the various samples examined:

No. 1. Choice golden rod honey from Wm. Thompson, Wayne Co., N. Y. Price 25 cents per lb.

No. 2. Choice comb honey from Githuns & Rexamer, Phila., Pa. Price 25 cents per lb.

No. 3. Same as No. 2.

No. 4. " " " "

No. 5. Strained honey marked C. O. Perrine, Ind. Price 20 cents per lb.

No. 6. A very dark honey exhibited at Indiana Beekeepers' Association.

No. 7. Choice clover honey from Charles Israel, N. Y., 25 cts. per lb.

No. 8. Pure white clover honey, 30 cts. per lb., marked G.R.X.X., Pennsylvania.

[1] Chem. News, Vol. 38, p. 93.

No. 9. Honey in comb, 30 cts. per lb., locality not given.

No. 10. California comb honey. Bought in Lafayette, Ind., 20 cents per lb.

No. 11. Same as No. 5.

No. 12. Eagle brand honey (in comb) Cayuga Co., N. Y. Bought in open market, Lafayette, Ind. Price 25 cts. per lb.

No. 13. White clover honey. From C. W. Hutchinson, Acton, Marion Co., Ind.

No. 14. Sample from Louisiana, C. F. Muth, Cincinnati, Ohio.

No. 15. Basswood or Linn honey from Illinois, C. F. Muth, Cincinnati, Ohio.

No. 16. Mangrove honey from Florida, C. F. Muth, Cincinnati, Ohio.

No. 17. Mangrove honey from Florida, C. F. Muth, Cincinnati, Ohio.

No. 18. Pure white clover honey, apiary, M. B. Shaw, 378 Union St., Indianapolis, Ind. Price 30 cents per lb.

No 19. Strained honey from choice selected white clover, 40 cts. per lb.

No. 20. Pure extracted honey (crystallized), 20 cents per lb., from R. F. Weir, South River, Maryland.

No. 21. Pure extracted honey (liquid), 20 cents per lb., from R. F. Weir, South River, Md.

No. 22. (No brand), from J. Hepsberger, Md., 25 cts. per lb.

No. 23. Comb honey made in Tippecanoe Co., Ind. Price 20 cents per lb.

No. 24. Strained honey. Bought in bulk. 20 cents per lb.

No. 25. Comb honey bought in open market, Indianapolis, Ind., from H. K. Thurber, N. Y., 25 cents per lb.

No. 26. Pure machine extracted honey, Italian apiary, F. W. Abbott, Indianapolis, Ind. 30 cents per lb.

No. 27 Sample marked B. F. Davis, North Salem, Hendricks Co., Indiana.

No. 28. White clover and basswood honey (Comb). Linden Place apiary, Indianapolis, Ind., Pugh & Dougherty.

No. 29. Choice extracted honey, strictly pure, 25 cents per lb., from McCaul & Hildreth, New York.

No. 30. (No brand), from Chas. S. Duval, Spencerville, Md., 20 cents per lb.

No. 31. Comb honey made in Tippecanoe Co., Ind. 25 cents per lb.

No. 32. Comb honey from Chicago, Ill. 20 cents per lb.

No. 33. Comb honey made in California. 20 cents per lb.

No. 34. Strained honey, marked white clover XXC & R, 30 cents per lb.

No. 35. Comb honey bought in open market, Indianapolis, Ind. 25 cents per lb.

No. 36. Pure extracted honey, from F. S. Bull & Sons, Valparaiso, Indiana.

No. 37. Pure extracted honey, from Dougherty & McKee, Indianapolis, Ind.

No. 38. Extracted honey (dark). Supposed to be from sunflowers.

No 39. Sample donated by C. F. Muth, Cincinnati, Ohio.

No. 40. Clover honey donated by C. F. Muth, Cincinnati, O.

No. 41. White sage honey, J. E. Pleasants, Santa Ana, Los Angeles Co., Cal.

No. 42. Sumac honey, J. E. Pleasants, Santa Ana, Los Angeles Co., Cal.

No. 43. Clover honey from near Cincinnati, C. F. Muth, Cincinnati, Ohio.

For convenience of study I have arranged the analyses of the above samples in five groups. In Table 1 are collected the analyses of those

TABLE NO 1. HONEYS ADULTERATED WITH STARCH SUGAR.

No. of analysis.	Per cent of water.	Per cent of ash.	Per cent of albuminoids.	Per cent of reducing sugar.	Polarizations. Direct.	Temp. C°.	Invert.	Temp. C°.	Per cent of sucrose by polarization.	Per cent of reducing sugar after inversion.	Per cent of sucrose by reduction.	Per cent of total solids.	Per cent of solids not determined.	Per ct. of reduc. sug. before inv. to total solids.
1	19.79	0.36	.26	60.18	52.25	30.5	——	——	3.99	61.33	1 09	80.21	15.42	75.03
2	16.93	0.21	.07	57.40	74.50	21.5	——	——	——	59.85	2.33	83.07	25.39	69.09
3	——	——	——	51.99	74.00	24.5	73.80	24.00	——	——	——	——	——	——
4	——	——	——	60.91	9.50	25.0	——	——	——	——	——	——	——	——
5	22.45	0.31	.24	40.00	89.50	21.5	67.50	21.60	16.50	57.00	16.15	77.55	0.50	51.5
6	15.41	1.27	.35	57.60	24.65	23.0	16.90	22.60	5.84	64.35	6.43	84.59	19.53	68.09
7	19.07	0.18	.00	65.23	26.38	25.5	23.50	25.00	0.00	64.85	0.00	80.93	15.52	80.60
Mean	18.73	0.47	.18	56.19	——	——	——	——	6.58	61.48	5.20	79.27	19.27	70.08

TABLE NO. 2. HONEYS APPARENTLY ADULTERATED WITH SUCROSE.

8	23.99	.16	.18	58.85	1.30	25.0	-16.50	24.0	13.49	74.07	14.46	76.10	3.42	77.33
9	16.09	.12	.18	69.64	-2.75	29.5	-12.25	30 5	7.37	75.29	8.22	83.91	6.60	71.03
10	15.01	.04	.24	69.75	-7.50	23.5	-20.50	23.0	9.81	80.25	19.47	84.99	5.15	82.01
11	22.45	.31	.24	40.00	89.50	21.5	67.50	21.6	16.50	57.50	16.15	77.55	20.50	51.58
Mean	19.46	.16	.21	58.81	——	——	——	——	11.79	71.65	14.58	80 64	8.92	70.49

TABLE NO. 3. HONEYS APPARENTLY ADULTERATED WITH INVERTED SUCROSE.

12	15.12	.23	.56	75.85	-15.50	21.5	-17.7	21.6	1.65	77.20	1.28	84.88	6.59	89.36
13	17.24	.04	.24	75.50	-17.20	25.5	-19.8	26.0	1.98	77.10	1.52	82.76	5.00	91.23
14	23.25	.40	.31	73.50	-15.00	25.0	-17.4	25.4	1.82	71.80	0.00	76.75	0.72	95.77
15	19.46	.14	.35	73.05	-15.25	25.0	-18.4	26.0	2.40	78.42	5.10	80.54	4.60	90.70
16	20.51	.13	.28	75.02	-19.15	25.0	-21.0	25.4	1.41	77.42	2.28	79.49	2.65	94.38
17	21.03	.13	.28	73.30	-18.85	25.5	-20.7	25.2	1.56	74.10	0.76	78.97	3.70	92.82
18	18.25	.06	.28	73.80	-17.35	22.5	-19.7	23.0	1.77	77.15	3.78	81.75	5.84	90.28
19	19.42	.08	.24	69.30	-19.70	21.5	-23.6	22.0	2.93	73.50	3.42	80.58	7.46	86.75
20	22.76	.06	.16	73.12	-14.50	26.0	-16.0	26.0	1.14	73.53	1 33	77.24	3.76	93.87
21	19.35	.04	.09	73.78	-13.00	25.8	-17.0	25.0	3.03	74.59	0.77	80.65	3.71	91.48
22	17.77	.10	.24	74.75	-14.25	24.5	-14.5	25.0	0.20	75.77	0.97	82.23	6.94	90.90
23	18.82	.11	.53	73.75	-14.55	21.5	-17.1	22.5	1.92	75.10	1.28	81.18	4.87	90.97
24	20.74	.08	.70	67.55	-14.40	21.5	-16.1	22.0	1.27	67.00	0.00	79.26	9.66	85.23
25	16.68	.08	.35	75.00	-15.55	22.5	-18.7	22.6	2.37	77.00	1.90	83.32	5.52	90.01
26	16.15	.05	.35	76.05	-14.10	22.5	-16.1	23.0	1.51	76.25	0.19	83.85	5.89	90.70
27	15.91	.14	.42	74.75	-14.95	25.5	-16.4	27.4	1.11	77.00	2.18	84.09	7.67	88.89
28	17.92	.05	.35	75.45	-14.40	22.5	-17.1	22.6	2.03	74.80	0.00	82.08	4.20	91.92
Mean	18.85	.11	.34	73.71	-15.75	——	-18.1	——	1.77	75.16	1.64	81.15	5.22	90.87

TABLE NO. 4. HONEYS BOUGHT IN OPEN MARKET, WHICH APPEAR TO BE GENUINE.

29	29.90	.16	.18	69.48	-2.50	25.0	-3.50	24.0	0.76	71.79	2.17	79.10	8.52	87.93
30	17.84	.41	.26	68.55	-1.95	25.0	-4.25	25.0	1.75	73.14	4.37	82.16	11.19	83.43
31	19.85	.13	.59	72.00	-12.55	23.5	-15.20	23.6	2.00	71.60	0.00	80.15	5.33	89.83
32	17.08	.14	.53	73.85	-11.25	23.0	-14.00	23.0	2.07	73.88	0.00	82.92	6.33	89.06
33	16.64	.07	.17	70.35	-9.40	21.5	-18.50	22.0	6 84	75.75	5.13	83.36	5.93	84.39
34	17.59	.22	.39	68.80	-6.55	21.5	-12.20	22.0	4.24	71.40	3.47	82.21	8.56	83.69
35	16.38	.25	.28	74.45	-8.05	23.5	-10.10	23.0	1.55	75.70	1.19	83.62	7.09	89.03
Mean	18.09	.20	.34	71.09	7.40	——	-11.11	——	2.74	73.32	2.19	81.93	7.56	86.77

TABLE NO. 5.
HONEYS FURNISHED BY PRODUCERS AND DEALERS, APPARENTLY GENUINE.

36	14.97	.14	.24	74.70	-11.55	22.5	-14.1	23.0	1.92	76.60	1.81	85.03	8.03	87.85
37	21.75	.03	.21	68.75	-12.15	22.5	-13.7	23 0	1.17	71.00	1.16	78.25	7.09	88.83
38	18.75	.27	.39	69.65	-5.10	25.5	-8.0	25.6	1.98	73.25	3.42	81.25	8.96	85 72
39	21.32	.77	.59	66.10	-10.59	25.5	-12.0	27.0	1.15	69.05	2.70	78.68	10.07	84.01
40	18.35	.08	.31	72.50	-11.88	25.5	-13.8	25.2	1.02	74.35	1.78	81.65	7.14	88.79
41	14.62	.05	.21	71.25	-11.50	25.5	-20.5	26.5	6.88	75.35	3.90	85.38	6.96	83.45
42	14.32	.06	.24	71.10	-12.10	25.5	-20.0	26.5	6.04	73.85	2.61	85.67	8.23	82.99
43	19.60	.07	.31	73.50	-12.85	25.0	-15 7	25.4	2.17	74.55	1.02	80.40	4.35	91.42
Mean	17.96	.18	.31	71.07	-10.99	——	-14.7	——	2.87	73.50	2.30	82.04	7.60	86.64

samples which were adulterated with starch sugar syrup.

In Table 2 are found those samples which apparently were adulterated with sucrose.

In Table No. 3 are grouped those samples to which it appears that invert sugar may have been added.

In Table No. 4 are found the analyses of those samples which appear to be genuine.

In Table No. 5 are collected the analyses of those specimens which were obtained from producers or dealers and which I have every reason to believe to be genuine.

REMARKS ON TABLES.

The temperature at which the direct polarization is taken is given so that if any great difference in the two temperatures should occur it can be at once noted. Since the temperature has a marked influence on the lævo-rotatory power of invert sugar it should always be taken into account in expressing the data of the work. In order to secure results which are strictly comparable some definite degree of temperature should be chosen, at which all the polarizations should be made or to which they should be reduced. I am now having an instrument constructed which will enable me to make all such polarizations at any selected temperature.

The percentage of reducing sugar is calculated for dextrose, and the numbers, therefore, must be taken with this understanding. In the last column of each table are found the percentages of such sugars in terms of total solids. This gives a much better idea of their relative amount than if they were expressed in percentages of the weight of the substances examined.

In the polarizations the numbers given are divisions of the cane-sugar scale of a large Laurent shadow polariscope in which 16.2 grams of pure sugar in a volume of 100 cc. will produce a right handed rotation of 100. The sucrose was calculated from the two polariscopic readings (before and after inversion) by the usual formula.

Table No. 1. In all these samples as indicated by the analyses, starch syrup (glucose) was largely used as an adulterant. In sample No. 5, very little real honey could have been present, the sample was composed almost exclusively of starch syrup and of sucrose which had been added to give it sweetness. In the other cases the sucrose which was found by analysis was probably originally present in the honey part of the mixture, since, had it been added as an adulterant, more of it would have been found. The characteristics of each sample as well as of all of them collectively can be seen by studying the table.

Table No. 2. The mean percentage of sucrose present in these samples as determined by double polarizations is 11.79 and by reduction 14.58. With the exception of No. 11, to which sucrose was undoubtedly added, I cannot think that any sucrose was added by producer or dealer, on account of the small percentage of it found. In such cases it is proper to suppose that the bees had access to flowers whose nectar was rich in sucrose or that they had been fed a solution of that substance. The use of solutions of sucrose as bee food is not unusual.

Table No. 3. These sixteen samples I have grouped together on account of their great lævo-rotatory power. For the first polarization this amounts to 16.75 divisions and for the inverted liquids to 18.10. It is possible that this great deviation to the left may have been due to the entire absence of dextrine or sucrose in the honeys, or that it might have been produced by the bee food being rich in sucrose which suffered a nearly complete inversion in the body of the insect.

It would be quite improper to def-

initely assert that invert sugar syrup had been added as an intended adulterant. I think it quite possible that bees having access to sucrose food might at one time produce a honey like that in Table No. 2, and at another like that in Table No. 3.

Table No. 4. These honeys all appear to be genuine although it is hard to draw the line between such samples as Nos. 31 and 32 and those found in Table No. 3. The mean reading to the left is 7.40 divisions before inversion and 11.11 afterwards. The mean of undetermined solids is 7.56 and the percentage of reducing sugar before inversion to total solids, 86.77. The means of sucrose as determined by both methods are low and fairly agree, although, as in the other tables, they differ widely in single instances.

Table No. 5. These honeys, obtained directly or indirectly from well known apiarists, I have every reason to believe to be pure. If they contain any adulteration it has been added by artificial feeding and not intentionally. It will be observed that these honeys are strongly lævorotatory and indeed so much so that some of them might have appeared in Table No. 3.

It will be instructive to compare the numbers in the above tables with those obtained by other analysts. Koenig[2] gives the following means of seventeen analyses :

Water	19.61	per cent.
Albuminoids,	1.20	" "
Grape sugar,	70.96	" "
Sucrose,	2.76	" "
Pollen,	0.17	" "
Ash,	0.19	" "
Phosphoric acid,	0.03	" "

O. Hehner[3] gives the following numbers as the mean of twenty-five samples :

Glucose,	67.2	per cent.
Water,	19.2	" "
Not determined,	13.5	" "

According to Hehner the fluidity of the honey does not depend on the amount of water it contains. In ten cases the quantity of glucose after inversion was less than before, in one instance 5.23 per cent less. The rotating power was generally zero, a condition which I have never found in American honeys genuine or artificial. These conclusions are so at variance with ordinary experience as to indicate that the samples analyzed were anomalous or the methods employed unreliable.

Sieben[4] gives the mean composition of sixty samples of honey as follows :

Dextrose,	34.71	per cent.
Lævlose,	39.24	" "
Sucrose,	1.80	" "
Water,	19.98	" "
Non-sugars,	5.02	" "

The solids not determined, as will be seen by the analyses presented in this paper, are of considerable importance. In adulterations with the starch sugar syrup these undetermined solids consist chiefly of maltose and dextrine. In many other cases dextrine, as will be shown further on, is doubtless present.

Genuine honey has also a slightly acid reaction. This acidity is due either to certain organic acids derived from the plants or, more probably, to an acid furnished by the bee itself, the kind and quantity of acids in honey have not been accurately studied. I have found the total acidity measured as formic acid to be about .02 per cent. That the acid furnished by the bee is formic there is little doubt. Will[5] states that he has found the active principle of the poison of all hymenoptera to be formic acid. Carlet[6]

[2] Nahrungsmittel. p. 161.
[3] Analyst, Vol. 9, pp. 64 et seq.
[4] Zeitsch. d. Ver. f. d. Ruebenzucker Industrie, Vol. 34, pp. 857 et seq.
[5] Schleiden and Foreps Not., Sept., 1848, p. 17.
[6] Comptes Rendus, June 23, 1884, p. 1550.

in a communication to the French Academy, show that the poison of all the hymenoptera has an acid reaction but that it contains also an active alkaline substance. The activity of the poison is conditioned on the presence of both the acid and alkali. The acid is always in large excess and each substance is furnished by a special gland. The inversion of the cane sugar in the organism of the bee may be due to the presence of these acids. On the other hand it is plain that certain species of pine and some other plants furnish formic acid and therefore the detection of this acid in honey is not positive evidence that it is derived from the bee. In a recent article[7] the author claims that the formic acid which honey contains tends to preserve it from fermentation. Honey-syrup from which the greater part of the formic acid has been washed out or expelled by heat does not keep as well as the normal product. The latest researchers show that this acid is deposited by the bees themselves by means of their stings. From time to time the bees apply to the walls of the cells of the comb the tiny drops of poison (formic acid), that gather on the ends of their stings. Sooner or later this remarkable antiseptic is incorporated with the honey. The preservative power of this acid is said to be greater even than that of phenol.[8]

A careful study of the results of these analyses shows the chief adulterants of honey are the following:

1. COMMERCIAL GLUCOSE.

This substance, on account of its honey-like appearance and low price, has been one of the most common substitutes for honey. Mixed with enough of the genuine article to give it a flavor it is sold extensively as pure extracted honey. A very frequent method of adulteration is to take a few ounces of genuine comb honey, place in a can, holding one or two pounds, and then filling up with glucose. The real honey will gradually diffuse throughout the whole mass giving the required flavor.

This, the most frequent sophistication of honey, is also the most readily detected. The high dextro-rotatory power of commercial glucose renders its detection by optical methods extremely easy. Containing as it does a considerable percentage of dextrine and maltose, its percentage of reducing sugar is consequently small. In ten samples purchased at random in the eastern markets three were adulterated in this way. In eleven samples purchased in the western market only one was glucose. This percentage, however, does not represent the actual extent of the adulteration. In making these purchases I endeavored to get a sample of each kind of honey on sale. It will be found that the strained honeys of commerce are quite generally adulterated with glucose.

Detection of adulteration with glucose.

I have never yet found a genuine honey which is not lævo-rotatory. Nevertheless, the turning of the polarized plane to the right is not conclusive evidence of the presence of glucose unless the amount of deflection is more than 100° of the cane sugar scale, when the amount of the substance taken for examination is the same in weight as that required by pure sucrose to read 100 divisions.

After treatment with .1 volume of hydrochloric acid and heating to 70° the solution is cooled and repolarized. If now it still reads to the right the presence of starch sugar-syrup is established. In such cases, after inversion the free acid is neutralized and the reducing sugar determined by an alkaline copper solution. The percentage of this

[7] Deutsch Americanische Apotheker Zeit. 5, 21 p. 664.
[8] Comptes Rendus, Vol. LXI, p. 1179.

sugar will fall much below seventy unless a large part of the adulteration has been due to cane sugar.

2. CANE SUGAR (SUCROSE).

A thick syrup made of cane sugar is also used to adulterate honey. There is only one reason why it is not more extensively employed, viz.: its tendency to crystallize. On this account it can only be used in small quantities. There would be no difficulty in detecting added cane sugar in honey were it not for the fact that we cannot definitely say how much of this substance is present in the genuine article. In the analyses given by Seiben[9] the mean of sucrose in the sixty samples was 1.08 per cent; in one case, however, it amounted to eight per cent. In the analyses given in this paper the mean percentage of sucrose in eight samples of genuine honey was 2.87 and in seven samples which appear to be genuine, 2.74 and in the samples contained in Table No. 3, sixteen in number, which may be genuine, 1.77 per cent. Judging from these analyses I would say that it is a rare thing to find a genuine honey which contains more than four per cent sucrose. In the two samples of California honey, Nos. 41 and 42 the percentage of sucrose is very high. Doubtless the kind of flower and climate have much to do with this and it would not be strange if California honey, produced in the unique conditions of climate and flora which there obtain, should develop some constant difference from honeys produced in other parts of the world.

Detection of cane sugar in honey.

The presence of cane sugar in honey is easily detected by the process of double polarization. Illustration: Sample No. 14, weight of sample taken, 16.2 grams in 100 cc., length of observation tube 400 mm.; reading of scale, −15; divide this number by two gives −7.5 divisions, correct reading for a 200 mm. tube. After inversion the reading in a 220 mm. tube was −20.5 divisions, temperature 23°; difference of the two readings 13 divided by 144 − 11.5 equals 9.18 per cent; equals sucrose present.

The method of double reduction of Fehling's solution once before and once after inversion of the cane sugar can also be employed. The optical method is quicker and, when properly conducted, more reliable than the method by reduction. If the rotatory power of the sample is quite small, two or three times the normal quantity may be taken and the polarization conducted in a 400 or 500 mm. tube.

3. INVERTED CANE SUGAR.

As an adulterant of honey the inverted cane sugar is much superior to the sucrose itself. It does not crystallize and when properly made is palatable and wholesome. Sucrose is usually inverted by heating with an acid and for commercial purposes sulphuric acid is the one generally employed. The difficulty of removing all traces of this acid renders the detection of inverted sugar somewhat easy by the presence of the traces of the sulphuric acid which still remains in the solution. It is now said, however, that inverted sugar is made in large quantities by treatment with brewer's yeast and without the use of acids of any kind. When added to honey in large quantities it can be detected by its great lævo-rotatory power which however decreases rapidly as the temperature rises. At 23° a pure invert sugar solution would mark −32.5 divisions. In the present state of our knowledge it would be difficult to detect the addition of a small quantity of invert sugar to honey. From the above studies it appears that pure honey is essentially com-

[9] Op. cit.

posed of invert sugar together with a certain portion of sugars optically inactive (anoptose), water, a small quantity of albuminous matter, ash, and solids not sugar, *i. e.*, those which while resembling sugar in chemical composition are yet not detected in the ordinary process of analysis.

In addition to the above it appears from the results of a large amount of work done at my suggestion by Mr. G. L. Spencer, that pure honey contains a varying amount of dextrine which in some cases amounts to as much as four per cent.[10]

This investigation is still in progress and therefore its result cannot yet be announced. The presence of dextrine in honey doubtless accounts for the phenomenon that in some samples of pure honey the lævo-rotatory power is very small or, according to some authors, entirely disappears, which would not be the case except for the presence of some highly dextro-rotatory substance.

Agric. Dept., Washington, D. C.

FOREIGN NOTES.

By Arthur Todd.

Frank Cheshire of London, Eng., has been kind enough to send me the first two parts of his new work entitled, *Bees and Beekeeping: Scientific and Practical.*

Not having time fairly to examine or pass any opinion on them, I sent them to Professor Hasbrouck, and requested him to kindly give me his views. The following are his words:

Bound Brook, N. J., Oct. 28, 1885.

I have read first and second parts of Frank Cheshire's new book, *Bees and Beekeeping: Scientific and Practical,* and I have been pleased with it, as with no other new book that I have seen for a long time. It will be a very valuable contribution to general entomology, and the only exhaustive work on bees yet written. The plates are magnificent, original, and so skilfully arranged as to demonstrate the anatomy of the "bee," as has not heretofore been done. They prove Mr. Cheshire to be one of the very ablest microscopists in the world.

The publishers also deserve great credit for the elegance with which they have done their part. Every beekeeper on this side of the water will want this book, and if the practical part proves to be as much in advance of all competitors as the scientific part is, we shall all be obliged to have it.

[Signed,] S. Hasbrouck.

The British Bee Journal in commenting on the work speaks most highly of its merits as seen in the two parts issued, and only regrets that it will be at least nineteen months before the work is complete.

It appears by a recent decision in a Sheriff's Court in Scotland that the ancient laws relating to bees are not binding if the circumstances attending their application are considered strained, by the light of modern usage and thought. The

[10] Since this investigation was undertaken the author (Rep. Anal. Chem., 1885, p. 163) has shown that honey gathered from pine forests contains dextrine, often in such quantities as to become dextro-rotatory. Klinger claims that this phenomenon is not exclusively confined to honey of coniferous origin. According to our observations even left-handed honey may contain marked quantities of dextrine. If this be so it can hardly be true as W. Lenz (Chem. Zeit. 8, 613) affirms that after fermentation honey yields no optically active substance.

action was brought by the pursuer for 5.00, the value of a swarm of bees.

The pursuer resided with his mother, Mrs. Allison in Glenluce. He was from home the morning the bees swarmed, and his mother (an old woman) was watching the bees. She saw they were working as likely to swarm. Her garden, where were the bees, runs along the roadside. She went in the house for some ten minutes, and when she came out, she saw the defenders standing on the road beside a horse and cart.

The bees during her absence had come off, and the two men were hiving them into a skep.

She went forward and told the men the bees were hers. They said she was too late in coming, and she replied she was here now. She did not see the bees leave the skep, but she knew they had come out of her garden. The defenders stuck to them, and took them with them. Other evidence was given to show that when the bees were being skepped, there were bees flying backward and forward between this swarm and the skep in the garden, and that it was the habit of bees when they came off, if they alighted in the neighborhood of the place, to keep coming and going in this way.

There were no other bees hived in Glenluce that day.

The evidence of the defenders was to the effect that they were passing into Glenluce when they discovered this swarm of bees hanging to a branch on the side of the road. They were on the opposite side of the road from Mrs. Allison's garden. There was no one there looking after them, and they considered they had a right to take possession of them. McKie remained with the bees, and Lockrie went for a skep.

After they had got them into the skep, and were putting the cloth over them, Mrs. Allison came, and looked over the bank, and said, "Men, these bees are mine." McKie replied that she was too late of coming, and that she had been rather careless about her bees. He was detained about an hour over the bees. Mr. McFadyean contended that according to the law, as laid down by Erskine, when bees hived and got away, they recovered their natural liberty, and became the same as wild birds, the property of the first person who captured them again.

The sheriff said he had a great respect for Erskine, and would be sorry to upset the law of Scotland, but he would be still more sorry to allow an old woman's bees to be taken in this way within five yards of her own door, because they had swarmed when she was absent for a few minutes, and she had not instantly pursued them. He thought this was a barefaced case of appropriation of another person's property. It was a case that should never have been defended. For two respectable men to appropriate another's bees in this way was disgraceful. It was all very well to quote an old law that when bees got away they became wild; but he could not hold that they had got away or were wild, so long as they were within a few yards of the house to which they belonged. He gave decree for £1 and expenses.

The central association for the encouragement of beekeeping in Italy has lately held a meeting at Milan, and guests from Switzerland, France, Germany and England were there. Wm. Cowan, editor of the British Bee Journal was there, and promises a detailed description of his visit, the meetings, etc., and in future numbers of "Notes," I shall hope to give a few extracts from the same.

The great bee master, Dr. Dzierzon is to have a Golden Jubilee shortly, and festivities are being organized in Germany to celebrate the same with befitting splendor. Delegates from Italy and other countries are to visit the doctor.

A prominent Britishbeekeeper has started for the region whence came the Carniolan bees, with a view to investigate in their birthplace the merits claimed for them. He proposes taking in, on his return journey, the various countries on the eastern coast of the Adriatic sea, and also visit several queen-rearing apiaries in Italy. For their gentleness, Carniolans seem to be getting into favor in England, but from what I have heard their great swarming propensity is against them for a business bee.

The honey harvest in Switzerland for 1885 has been one of the finest of the century; 50 to 100 lbs. is announced on every side, and often from 100 up to 200 lbs. per colony.

In England the season has been good, and one beekeeper in south of England expects to record by end of the season a minimum crop of 200 lbs. per colony.

Compared to the returns from my bees in Pennsylvania, such news almost makes me wish myself back in old England again.

The price of honey has fallen considerably in Switzerland, principally from too much haste on part of producers to rush their crop on the market. There is no harmony of action amongst beekeepers there any more than here, and honey is rushed in quantities into the great centres of population while the smaller towns are left unworked.

Lately there has been a great cry out about the manufacture of honey in Switzerland; and Monsieur Bertrand took the trouble personally to investigate the matter. He found there was only one factory for false honey; buying its glucose in Germany, and its honey in Italy. He found two small shop-keepers who mixed their honey with glucose before selling their patrons the pure Swiss honey from the Alps, but, otherwise, the mountain of talk brought forth a very small mouse of adulteration.

Many merchants in France and Germany decorate adulterated stuff with the name of Swiss honey, Alpine honey and so on, and such conduct has contributed to discredit Swiss honey more than anything else.

Phila., Pa.

HINTS FOR BEGINNERS.

By J. E. Pond.

HIVES AND THEIR MANIPULATION.

In beekeeping it is well to follow the old rule, viz.:—"first get your cage and then your bird." This

rule should be followed by the beginner, for the reason that fully as much depends upon the choice of hive as upon any other one thing connected with the business. In choosing a hive I need not say that movable frames are indispensable ; as it is now well known that no others can give even fair results. In the choice of frame, regard should be had to the condition and surroundings of one's locality, and the purposes which one has in view, viz., gathering surplus comb or extracted honey. A hive should be constructed as plainly and simply as possible, and as few " contraptions " as necessity alone requires should accompany it. A plain box with rabbets for the frames to rest upon is all that is needed or required, and any expense made beyond that point is so much money thrown away or simply expended for mere looks. The construction of the hive should merely be such that it will accommodate the style and size of frames decided upon ; and I will say right here in the most imperative manner, that but one size and style of frame should be tolerated in a given apiary. As upon the frames depends the whole measure of success or otherwise, they should be constructed with the greatest care, and as nearly mathematically exact as is possible, so that they may be interchangeable not only in a given hive, but with the frames of every hive in use. The necessity of this if not seen now by the novice, will be at once appreciated the moment he begins practical work. In the choice of hive it should be borne in mind that good results can be obtained from any of the frame hives in common use, but that some of them are more in use than others, and of course it follows that those are the most valuable, that have the largest endorsement of beekeepers of experience by their use of them. Probably the praise given to the different forms of frames is so given because their owners have become accustomed to using them, and don't care to change ; but it is probable also, that had they chosen a different form at the start, they would have given that form the same praise. For myself, I have for years used the " L " frame so called, and have found that " it fills the bill " far better than any other ; and I have given nearly all a fair and thorough trial. I do not propose here to advertise any form of frame, however, but leave its selection to the choice of each individual. While movable frames will allow of their being taken out of the hive and examined at any time, it is not advisable, save for the purpose of gaining manual dexterity in manipulation, to examine a hive unless for a special purpose. A colony of bees cannot, it will be seen at once, be pulled over, taken out and returned, without creating considerable disturbance, and such disturbance ean be but detrimental to the working of that colony.

The rule to follow then should be never to open a hive unless with some special object in view. If it is desired to show friends or visitors the ease with which bees can be operated upon, it will be well to devote one colony to that particular purpose ; by this means the minimum of

disturbance will be made. As I said in my first article, the time to purchase bees is in the spring rather than the fall, for while they can be purchased more cheaply now, the extra cost in the spring is not so great as to overbalance the chance of loss during the winter, especially with the actual beginner.

Hives should be purchased in the fall, however, and some portion of the time during the winter devoted to examining them, removing and replacing frames, sections, and surplus honey receptacles; by this means manual dexterity will be gained, and such dexterity is greatly to be desired.

It is a mooted question whether surplus comb honey or extracted pays the best. This is an individual question, and each must determine for himself. Much will depend upon the locality, and much also upon the operator. If surplus comb honey is decided upon, then a study should be made of the various methods in vogue of storing the same, and here there is so great a variation of opinion, that it is hard to decide which is the best; but as all are largely used and with success, any choice then will ordinarily show good results.

In the gathering of extracted honey, the weight of evidence is on the side of two or more story hives, each story of course being a duplicate of every other. Probably the beginner will succeed better the first year in working for extracted honey, as swarming is brought more under control by so doing, and of course much trouble is thus avoided. It is difficult to advise any given person in regard to apiculture, because so much depends upon the person himself, his disposition, strength of mind, power of fortifying himself against losses that are always liable to occur, and patience to work with insects that have so formidable a weapon of offence and defence; and also to bear up under difficulties that happen even in the best regulated apiaries. A careful course of study on all the points indicated in this article will be of value in forming an opinion and making a choice; and about all that can be done in the limited space allowed me, is to guide my readers to the right path, rather than to attempt to make that path for them.

The golden rule of beekeeping is one that should ever be borne in mind, for unless it is kept constantly in view, and closely followed, nothing but disaster will result. It is the rule of *Otto*, viz. :—"Keep your stocks strong."

Beekeeping is made up of two parts, viz., theory and practice, and they should go hand in hand together; not however like a party whom I once knew, who bought several works on beekeeping and never looked at them excepting when something turned up out of the usual course of things; and many an accident happened, or loss occurred to him, for the reason that he would not look up a point till obliged so to do by something unusual taking place among his bees. Study, and careful study too should be preliminary, and the theory being well learned from the books, then one is ready and able too, to apply principles to actual practice.

Foxboro, Mass.

FEEDING BEES AND FEEDERS.

By P. R. Russell.

No. 2.

I begin feeding about the first of Oct. and intend to finish about the 15th. No use to feed before this time for winter stores because the bees are still getting honey and too much brood still remains unhatched. No need to fear unsealed stores. After the feeders have all been removed, there are no great heaps of rattle-traps to lumber up the store house as with other kinds of feeders because I have the jars all filled with nice pear, quince, tomato or other sauce for winter; you see I have all my fixings do double duty if possible.

The bees are now all ready to pack for wintering on their summer stands. I replace the feeding board with a light frame covered with wire cloth and reinforced centrally with two cross bars to prevent sagging. This I place on the frames, wire cloth down, which allows bee space under and that is all I want. I want my bees to winter on their combs and not cluster in a ball on top of them; An old piece of carpeting is laid on the wire frames and then the big chaff cushion with plenty of ventilation above it through the gabled roof. I give them but very little attention during the winter, save once or twice I draw out with an iron rod, hooked at the end, any dead bees that may fall to the bottom board.

I open the spring campaign about March 1st by offering a bounty of the well known candy mixture to encourage the recruiting of young bees. We now begin the "grand rounds." I approach the first stand, place my ear at the embrasure, knock lightly on the sally-port, when I hear from within the old familiar challenge:

Halt! Who comes there?

"Friend with the countersign."

"Advance friend and give the countersign."

"Good candy."

Countersign correct, advance friend.

Having removed the covering it gives me great joy to see the little soldiers all massed up against the wire cloth at "present arms" waiting for their rations. All is clean and bright, no foul odor arises, but the fragrant sweet waxy smell of the hive. I take from my haversack their quota of candy dough, place it on the wire cloth directly over the bees, cover it with a little patch of enamelled cloth, and then go to the next hive and repeat the operation and so on until all have been supplied. If this food is not mixed too thick and only powdered sugar is used, it will all be eaten up clean. But if it is placed so that the bees can run all over it they will suck the honey out of it and leave the sugar to fall down on the bottom board. I keep them supplied with this food as long as they appear to need it. During the pleasant days of April I place a suitable feeder in the open air, in a sunny nook, some rods away from any hive and each day supply it with a quantity of sugar syrup made somewhat thinner than that used in the

autumn. This manner of feeding will not do, however, if there are other bees in the neighborhood, or in the fall of the year. By the side of this syrup feeder I supply plenty of rye meal and it is just fun to see them carry it off. I discontinue all feeding with the first bloom of the cherry tree which will be about the 10th of May. At this time if I have fed judiciously, my frames will be well filled with brood way up to the top bar and but little food will be found in the hive. The bees are now ready for the approaching harvest. This closes up feeding operations for the year.

I seldom have occasion to feed during the summer months, but if I should this is the way I should do it, and this idea alone is worth in my opinion a whole year's subscription to the journal. Place the fall feeding board with the three-inch hole, in the centre of the hive; then take any tin cylinder three or four inches high without top or bottom that will fit into the hole in the board and set it in the hole. Then fill it with the above mentioned sugar dough and cover it over. The food will pass through the wire cloth no faster than the bees take it and is much safer for a summer food than liquids which always incite robbing.

I saved a weak colony this summer that was being ruined by robbers and on the point of starvation. The robbers left and it built up rapidly by the above plan; but success will largely depend upon having this food of the right consistency which you will soon ascertain by a little practice. I have quite a number of the popular feeders lying round that have been mustered out of service for disability, among the poorest of which I count those that are used at the entrance. These latter have all been court-martialed and drummed out of camp. To my beekeeping comrades who have, "read a fiery gospel writ in burnished rows of steel," I give you a soldier's greeting hoping some thought in these straggling sentences may lighten the labors of your "forward march."

Lynn, Mass.

A GUIDE TO THE BEST METHODS OF BEE-KEEPING.

By J. L. Christ.

R. F. Holterman, Translator.

(Continued from p. 228, Vol. III.)

The grating is placed in line with the entrance and the bees are almost compelled to build their combs regularly to it, so they build up the pane of glass only very seldom, and also in winter and early spring mould is seldom found even in damp weather as the air has communication with all the spaces and can draw through the combs.[1]

[1]This grating is much preferable for a freer passage of air and the tendency to regular building of comb than a board with a round or square hole in the centre through which the bees went on building. This circumstance made me resolve even in the earliest years to discard the board and favor the grating. On the former the capping of wax from the winter stores and all other refuse remains lying, which not only makes it very difficult for the bees to carry out from amongst the combs but it gives the moths nourishment and a place to locate. Also by many top stories through the irregular building and cross running combs the pane of

One can also by this arrange through opening the slide before the openings between combs, upon sultry days, to give the bees great relief with the fresh air and draft which the strong colonies require very much. In winter during wet warm weather one can make the hive cooler which is often very serviceable; yes, even necessary, as I have found honey running out of the hive at such a time.

In addition to all this my wooden hives stand solid, fit exactly one upon another and have no instance as yet, although they stand simply upon one another without fastening, of any being blown over; but how often do the straw skeps stand lame, get crooked and are bent with the weight of honey.

What havoc can the mice create in the winter in the straw skep; but with the wooden their energies to get in are vain.

Lastly, the straw skeps are generally too large and lack many advantages in consequence. One can easily take in such, too much honey from the bees, although not easily too little; but one can only leave to much as one year's honey may be worth more than another, even if bees are left two winters of stores, there is little lost as one can harvest so much the more next year as the bees will consume not a drop more. Yet it is well when one can conveniently take the extra stores and the interest from capital in the apiary drawn yearly and renewed.

glass is built over so one can only see one comb. Also a board through changing from moist to dryness, crack and warp which is unpleasant and injurious if not known in time.

In placing underneath large straw skeps I can furthermore not always hit the time so that the last one will be built full and this empty space is very injurious in winter because of the cold as well as in the fall and particularly in spring because of robbers.

Again, my little wooden top stories have many advantages which one sees and finds only after using them, one can reap a harvest with them in even very moderate seasons.

One can supply small, medium and large swarms proportionately top stories and give them three, four or five stories as is best. One can always enlarge them as long as there is nourishment in the field. One can in the fall, middle of winter, in spring, or when one wishes, help other bees in want of stores and give them one or two stories from colonies having abundance of stories set away. One can at all times of the year in a few minutes unite two or three weak colonies, place a weak colony over or under a strong one. If one has a strong colony which swarmed late and did not have enough time to supply itself with sufficient nourishment for winter and one does not wish to unite it with another swarm one can give them a story with honey and next season it will be the youngest and best swarm, and if he has not enough combs he can get a lower story with empty combs and there are many more advantages of which experience is constantly reminding us.

I would hesitate to recommend this kind to all lovers of bees, had I not been convinced of their superi-

ority by much experience and long use, as do also all that have copied me recommend them strongly. Yes, I am prepared to give as a thank-offering my whole apiary to any one that will show me a better and more useful dwelling for the bees.

HOW TO MAKE THE SAME SERVICEABLE IN RAISING BEES.

Out of the preceding much light has been given as to how to use the stories. If one wishes to have put in a new swarm, place (if the swarm is strong) four such stories[2] one upon another quite free without attaching them in any way; only should they not fit exactly on one another they should be glued in the cracks, and the swarm put into it. If, after two or three weeks, the fourth story is half full, if four have been taken, or it is three-quarters full, place another story under to prevent the bees from throwing a swarm which is not good in fact injurious, when the fifth is full as before, put on the sixth and so on until the bees build no more, which generally takes place in August.

As soon, however, as one has placed a story underneath, it is necessary to close up the upper entrance after two or three hours or the bees will not continue building readily; it is also necessary with old stocks which one does not wish to let swarm or from which one does not wish to make nuclei. One gives them in April, if they are populous enough (before, they will not build) and they have enough stores; the robbing time is past and it is warm enough to build an under story; for to give several at once is not serviceable. First, the bees prefer building in one rather than two empty ones; next the in-carrying bees lose too much time running up the empty story; then they cannot guard the entrance thoroughly against robbers, ants, moths, etc. When this story is more than half filled give them another and so on; I always did this placing-under early in the morning when the bees were yet quiet, particularly if the morning is somewhat cool; one places a story upon a board[3] and stands with the same before the hive. Your assistant stands behind it, raises it,

[2] In such cases one must put neither too many nor too few stories. If one takes too few, if the next day is a warm one, the bees may move out as the heat forces them out; but if one takes too many and the room is too great in proportion to their number they are discouraged and will not build out. For an ordinary swarm three stories are generally sufficient. In my presence some years ago two swarms issued about the same time from equally strong parents, one was put in three stories the other in four. The first not only filled its three stories but a fourth I placed underneath it; the others quit building when two were filled, so I took the fourth away and they at once commenced building again and eventually filled the fourth one.

[3] I generally call this the under-story board, it might also be called the alighting board. It should be allowed to project half a foot, so the bees can conveniently fly from it, rest and sun themselves, it is inconvenient for them if they cannot have considerable room at the entrance. The alighting board is, therefore, to be one foot eight inches long and one foot three inches wide. In front it can be made to slope away or cut rounding. With the thick board, I had for many years much trouble on account of warping. I used an oak board which was particularly bad if cut from the whole log, viz., through heart and all; after some rains and sunshines on account of the strength of the board, raised up hive and all from warping. Therefore take lighter half-inch and not such strong material. Let the board have less strength than the weight of the colony can resist. Pine is good.

then draws out the old board[4] and replaces the new story upon the board; this must be done rapidly. This is always essential in handling of bees and everything should be ready beforehand that nothing be wanting in any operation, and one should be fortified with bee-cap, gloves and boots.

Rodheim, Germany, July, 1783.

[*To be continued.*]

EDITORIAL.

With this number closes another year and the third volume of the Apiculturist. While our cares and burdens during the past season have been very trying, yet we are wonderfully cheered and encouraged by the steady and healthy growth of our journal, an omen of future prosperity.

The Apiculturist enterprise was entered into as an experiment and now we are warranted in making the statement that, so long as we retain the confidence of the keekeepers by continuing in a straightforward, manly course, there is no question as to its future success.

We are pleased to know that the most prominent and practical apiarists are gradually gathering about us and endorsing our position so that the richest thoughts of the ripest intellects will be found in our columns.

We can safely say that the Apiculturist for 1886 will be far more interesting and valuable than ever before. We mean always to maintain the same independent course in conducting our journal which has characterized it from the start, and all those who send articles for publication may rest assured that they will be treated with careful consideration.

There are those who seem to feel that they can pursue any course that they choose no matter how injurious it may be to apicultural interests, and then suppress any opposition to, or public investigation of, the same.

So far as they can control the public press and the writings of others, this may be possible; but we wish it plainly understood that the columns of the Apiculturist are always open to truthful investigation and the free expression of thought and opinion so long as such are clothed in courteous language and intended to further the interests of apiculture.

One of the most important subjects for present consideration is association work and, as we have often said, there must be more united action ere apiculture assumes its legitimate position. We have in the National

[4] One must take away the old board as generally there are a number of bees upon it and many would be crushed if one should shove or place upon it the old story. These bees remain sitting upon the board in the morning and often re-locate themselves. One should, therefore, lay the board near the stock or upon a stool in front of the stock so the bees can run in again. If the weather is wet one should turn them upon the new alighting board with a goose wing, so none of them will perish. It is in manipulating, and particularly placing under very much easier and better, if one can leave between each colony enough room to place another colony. Upon this place one should set the empty under story and board, then place the colony upon it and replace the whole upon the old stand. This is the most rapid and best way and no bees are crushed. If one has not sufficient room for this, however, it is easier to place the board and under story underneath the colony the evening before; the next morning one only has to raise the colony a little, draw out the alighting board and let the stock rest upon the new under story; this is a good way.

Beekeepers' Association the nucleus around which our interests should cluster and to which our efforts should be directed. The only effectual method of producing the desired results is to make our associations representative in character, and this should be done *at once*. We trust that at Detroit this matter will receive careful consideration.

Having had a severe attack of nervous prostration we have been unable for the past three months to do justice to our journal work; but, thanks to a kind Providence and a strong constitution, our health is rapidly improving and we expect to be able to join hands with our western friends at Detroit and bring home to our readers considerable valuable information.

We take great pleasure in extending our heartfelt thanks to the many beekeeping friends for the unwavering confidence and continuous support which they have rendered us. We will not attempt to say more for words often fail to convey an adequate expression for such indebtedness, so we would ask our readers and patrons to continue such support in our work and to increase the circulation of our journal, just so long as they consider that we properly represent and foster the interests of the beekeepers.

As we pen the closing lines of our last editorial for this year, we are impressed with the solemn sense of the weighty responsibility resting upon us, and we look to the Source of all wisdom and strength for guidance in the work that is almost as dear to us as life itself.

During the past year many advances have been made in apicultural knowledge, and we look forward to still greater and grander developments in the near future.

Our readers can render us much assistance by distributing sample copies among their beekeeping neighbors, and we will cheerfully furnish, *free of cost*, all the sample copies needed for that purpose, if you will call for them.

With you we bid adieu to the old year, trusting that we shall again meet you at the commencement of the new year, with renewed energies and a stronger determination, with your help, to make the APICULTURIST the most reliable and best representative of the interests of the beekeepers.

CORRESPONDENCE.

INVERTIBLE HIVES.

DEAR EDITOR.

I have read with much interest Mr. Shuck's article on Invertible Hives in the last issue of your valuable journal. (I beg Mr. Newman's pardon, I should say valuable bee paper). "Manipulation of the right sort" says Mr. Shuck, "stimulates the colony and causes the brood to spread," etc. If we can, by simply inverting the hive get rid of the trouble of opening up, spreading frames apart, uncapping honey to stimulate, etc., as is generally practised in the spring, we have advanced a long step in bee culture.

What I notice more particularly in the article and which I think ought not to be lost sight of is the fact stated that "when a hive is inverted the bees at once proceed to destroy queen cells." "Nine similar trials your correspondent made with the

same result." Have we not here an easy method of preventing after swarms, superior to the "Heddon" or any other plan? Eight days after a first swarm has issued invert the hive, the bees will destroy the remaining queen cells and the thing is done. How many readers of the "Apiculturist" will try this plan and tell us how they succeed?

APIS CANADENSIS.

Kingston, Ontario, Nov. 15, 1885.

NOTES AND QUERIES.

—We have omitted the Dealers' List, and some other matter to give room to Prof. Wiley's valuable paper on the adulteration of honey and trust that the dealers will pardon the omission.

—Will those who have articles for the "Apiculturist" kindly send them in at once so that we can send out the January number on the first of the month.

—Our old subscribers must not forget our liberal club offers, but renew their subscriptions promptly and take advantage of them. Remember that all who renew can secure a choice warranted queen either Italian or Holy Land for $1.00 extra; the pay for the same not to be sent until spring, after you have been notified in the journal that we are ready to send our queens. New subscribers can secure one of these same queens for 50 cents extra under the same conditions.

As we shall book your calls for queens as your subscriptions are sent in, you must be prompt if you want your queen early in the season.

—The advantages offered by us to advertisers are not excelled. Try our journal and see if we are not correct.

—When taking convention reports "boil them down;" give us the facts and the cream of the proceedings. Avoid repeating old methods or sayings that have appeared in print over and over again; then we can give our readers much more information in the same space.

—Have you discovered any new and simple methods of managing your colonies? Have you had better results in introducing queens or caring for swarms, etc.? Have you found any difficulties hard to overcome or any new methods of avoiding any particular difficulties? If so, please tell our readers all about it, and in return others will perhaps give you some valuable information that will doubly repay you for your efforts.

Let us be one great family, each one willing to assist his neighbor, and we can assure you that the results will be pleasant and profitable.

—We are preparing a rich feast for our readers which will appear in the January number. Be sure and watch for the same.

— Some of the prices in the November club list were incorrect, but they are all right in the present number.

— On page 236 of our journal will be found a note referring to the adulteration of honey.

This note was prepared while I was at home sick, and escaped my notice when the journal was printed. While it is a fact a large portion of the "tumbler" or "prepared" honey found in the grocery stores in this section is justly described in said note, yet I have no hesitancy in saying that whenever a package of honey is labelled with the address and signature of the producer of said honey it will be found *pure*.

I have yet to learn of a beekeeper who puts adulterated honey on the market. And it would certainly be folly for him to do so under his own signature.

I would heartily urge the beekeepers not only to "put up" their

honey in "tumblers," but also in every kind and class of receptacle that will attract the attention of the customer.

While we cannot prevent the adulteration of honey, yet we can make a sale for pure honey by making a liberal offer for any adulteration found in any of *our* honey; placing such offer on our labels over our own signature.—*Silas M. Locke, Editor.*

—Of late there has been a question raised as to the advantages and disadvantages of using smoke to induce bees to fill with honey and become quiet.

While it is true that a smoker injudiciously used is a detriment, yet in our experience we have found it indispensable. Generally, a few puffs at the entrance and a few puffs as the cloth cover is carefully removed are all that is needed with perhaps a few puffs occasionally where the bees seem determined to run or fly out at the top of the hive.

One must acquire a knowledge of the habits and disposition of the bees under his charge, else he will have trouble, smoke or no smoke.

With the Cyprians, smoke has the the effect of making them almost desperate, and it affects the Holylands somewhat similarly, although the latter are not so irritable.

Our advice is, keep your smoker at hand, but use as little smoke as possible to produce the desired results. This must be acquired by practice.

TESTING BEESWAX.

—When beeswax is chewed it should have no disagreeable taste and must not stick to the teeth. In the adulterated wax the nature of the foreign material can generally be detected by the taste; the addition of fat can generally be readily detected. If it sticks to the teeth, the presence of resin may be assumed. A simple method of detecting the presence of fat in wax consists in melting it and placing a drop on a piece of woollen cloth; after it is perfectly cold and solidified, pour on a few drops of ninety per cent of alcohol and rub the cloth between the hands. The wax will be converted into dust, and will easily separate from the cloth if it contains no fat and will leave no stain; when it contains fat it will leave grease spots.—*British Bee Journal.*

— One of the most remarkable yields of honey ever heard of has just been gathered at an apiary near Riverside, Cal. The yield from thirty-three colonies was seven and a quarter tons, an average of 414 pounds to the colony.—*Canadian Bee Journal.*

— Another member of the Los Angeles County Beekeepers' Association has been called away. Peter Philipi one of the oldest and most skilful apiarists of this county, died on the 17th of August last, at his apiary, near San Fernando. Mr. Philipi was born at the ancient city of Frier, on the river Moselle, in Prussia, in 1831, and learned the trade of weaving. During his apprenticeship he took care of his master's bees, and took a deep interest in the business. He came to the United States in 1851, and located at Los Angeles in 1858, and soon after commenced beekeeping, starting in the business with only a few colonies. He made his settlement on government land at the Tujunga in 1871, and took with him forty-eight colonies of bees. By the opening of the season of 1876 he had increased them to 180 colonies, and during that season extracted 75,000 pounds of honey. During the season of 1884 he extracted about 45,000 pounds of very superior honey.

Mr. Philipi was one of the founders of the County Association, and for many years took an active part in our meetings. For the last four

years he had been afflicted with paralysis, but was able to attend to his apiary until about four months before his death. He leaves a wife and two daughters to mourn his loss, and a wide circle of warm friends who sympathize with them in their sorrow. —*Rural Californian.*

CONVENTION NOTES.

WESTERN BEEKEEPERS' ASSOCIATION.

The fourth annual meeting of the Western Beekeepers' Association convened in the Court House at Independence, Mo., at ten o'clock, A. M., Oct. 15, 1885.

President A. A. Baldwin occupied the chair. The morning session was taken up with the order of business. The committee appointed by the North Am. Beekeepers' Society said that the following railroads (A. T. & S. F., M. P., U. P. and H. & St. Joe) gave first-class freight rates on honey in glass and third-class on extracted honey. The committee also suggested that inasmuch as the transportation companies held monthly meetings that a committee be appointed that had more time than the present committee to prosecute the business further by visiting these meetings and if possible obtain a better schedule for beekeepers. Report received and the appointment of a committee deferred for the present.

The association next proceeded to the election of officers for the coming year, resulting in the choice of E. M. Hayhurst of Kansas City, Mo., President, R. M. Leahy, Higginsville, Mo., Vice President, James H. Jones, Buckner, Mo., Treasurer and P. Baldwin, Independence, Mo., Secretary. The remainder of the morning session passed pleasantly in the discussion of several interesting topics relative to bee culture; and as the object of the morning session was to get the machinery oiled up ready for business, the president appointed a committee to prepare subjects for the afternoon's discussion, and the association adjourned to 1.30.

Afternoon session.—The association was called to order by president Hayhurst at 1.30.

Several ladies took seats with the beekeepers, and although they took no part were very encouraging listeners.

The committee to prepare questions brought out the following which were taken up in order: "Does it pay to feed extracted honey in order to produce comb honey and what way can it be done the best?" Mr. Conser: I think it takes about three pounds of extracted honey to get one of comb and do not think it will pay. I feed by tipping the hive back and pour the honey in at the entrance; I do this at night.

L. W. Baldwin: I feed only to get unfinished sections completed which can be done just as the honey harvest is closing and not allow the bees to stop comb building. There is money in it if carried out in this manner.

A. A. Baldwin: I have fed extracted honey for this purpose and think it will pay but have not tested it by actual weighing and experiments.

2. "Which race of bees is best to keep for the purpose of getting comb honey?" R. B. Leahy came forward with a plea for the blacks as far as getting white capped and finished up comb honey for market. I think they enter the sections more readily before swarming and are less disposed to swarm. All things considered I prefer the Italians.

James H. Jones: I would not keep bees if I had to keep the blacks. Here the discussion was quite animated in bringing out the different traits of the two races, but the association came down solid for the Italians.

Other races of bees were spoken of, but no one had handled them sufficiently to be very enthusiastic over them.

3. "What way is best to winter bees?"

L. W. Baldwin: I winter my bees in the cellar and have found by the scales that on an average bees consume from ten to twelve pounds more honey per colony when wintered on the summer stand than when wintered in the cellar. This is quite an item in wintering a large apiary.

A. A. Baldwin: I think that outdoor wintering brings the bees through with more vigor and they usually swarm earlier, and I feel confident that bees packed with chaff will consume at least five pounds less honey than if not.

Pres. Hayhurst: I think chaff-packing saves stores.

The general opinion was that bees wintered on the summer stand should

be crowded on to as few combs as they can occupy with 20 to 25 pounds of stores and well packed.

4. "Does it pay to use reversible frames and section boxes?"

No one present had made any use of them except Mr. Conser who had used them and was well satisfied with them.

5. "How far from each other should large apiaries be located in a good honey country?"

This question brought out from some of the members statements of long flights for honey, but the opinion most generally accepted was that if placed not less than four miles apart there would be no conflict.

Association adjourned till nine o'clock next morning.

Association met at nine o'clock. The president not having arrived, vice president R. B. Leahy took the chair. L. W. Baldwin was selected to prepare the table of statistics. There being no other business to be transacted the list of questions was taken up and opened with the question:

6. "Does it pay the trouble to use wired frames?"

A. A. Baldwin: I have had but very little experience with them, but all I have examined showed the wire.

Mr. Conson: I have used them. Where a man is shipping bees I think they are of great benefit. In handling combs at home they are not of so much use.

L. W. Baldwin: I have had probably as much experience as any one present in handling and moving bees for several years and in all that time have not had a half dozen combs injured even if transported without springs and as far as I have observed cannot see any use for wires.

R. B. Leahy: If I were going to run for comb honey, using a frame with a short top-bar, I should not use wires. In handling, I had rather have them wired, especially for lower story.

7. "How can we remedy the turning out of the starters in the sections as the bees work them?"

This question called out this season's experience of several leading bee-keepers, and it was generally thought that the cause was the slow flow of honey, cool weather and colonies light for bees; some advocated using smaller starters, others turning the sections around, while others thought to crowd the bees would remedy it.

8. "What direction is best to have the hives face in winter time?"

Mr. Thorn: I would have them face the same way summer and winter.

S. W. Salisbury: I have loose bottom boards and raise the hive in summer and prevent the bees from lying out and let them down on the bottom board in winter. I think the hives should face the south.

7. "How should young swarms be handled to secure the largest amount of honey?"

James H. Jones: I have tried several different methods year after year and am not satisfied yet.

S. W. Baldwin: I make a nucleus from the swarm and put the rest in the parent colony.

P. Baldwin: A good way is to shut the swarm on five or six frames and compel them to go into the sections at once.

10. "Is there any successful way of introducing queens?"

E. M. Hayhurst having made the statement that he could introduce five hundred queens without the loss of one was called on to give his method which is as follows: After making the colony queenless I have a young queen caged in a Peet cage and place the cage directly over the cluster of bees and leave it there till I see the bees are perfectly reconciled to the queen; this will require two or three and sometimes several days. I then remove the queen cells and place the cage on an outside comb over some honey, remove the slide and rim out a plug through the comb letting the plug remain in place and leave it undisturbed for a week. If the bees are disturbed before the queen begins to lay she will become frightened, running and piping and the bees will chase and kill her. The important point is to have the bees reconciled, every cell out and no robbing.

L. W. Baldwin: I have found that colonies long queenless are very difficult colonies to introduce queens to, almost impossible with me.

Adjourned to 1.30 P. M.

Closing session.—Meeting called to order at 1.30, president Hayhurst presiding.

Several persons came forward and became members of the association.

A member handed in the question "What is the most simple, cheap and expeditious way for the practical bee-keeper to change his stock by re-queening?"

L. W. Baldwin: I put in cells after the colony has swarmed and again immediately after the honey harvest by taking the queen from the colony and the next day give it a queen cell.

A. A. Baldwin: I had just as soon as not have my colonies queenless for twenty days after the honey harvest and would take this time to give them a queen.

S. W. Salisbury: I requeen with swarming cells.

The question "Is it advisable to clip the queen's wings?" brought out a lively discussion.

J. H. Jones: I prefer to have my queens clipped.

S. W. Salisbury: I have tried clipping the queen's wings and think it induces the bees to supersede the queen immediately. I also have a great deal of trouble in finding a clipped queen when swarming.

L. W. Baldwin: The ease and facility in handling swarming are much in favor of clipped queens. I like the practice.

A. A. Baldwin: I do not think that clipping the queen's wings causes the bees to supersede her. The past season with an apiary of 135 colonies only two were superseded and they through natural causes.

A great majority of the members present practised it.

James D. Meador was appointed to endeavor to get a better schedule on apiarian products from the railroad companies.

Adjourned to meet in Kansas City, next spring, at the call of the executive committee.

W. B. Thorn of Glen. Kans., had on exhibition a colony of Holy Land bees. Mr. John Conser, of Glen, Kans., made a display of extracted honey. There was no general display.

The following is the number of colonies of bees, pounds of honey and wax represented:

No. colonies	last fall,	1,528
" "	this spring,	1,138
" lbs.	comb honey,	33,557
" "	ex. honey,	10,285
" "	wax,	196

P. BALDWIN, *Secretary.*

THE NORTH AMERICAN BEEKEEPERS' SOCIETY.

This society will hold its 16th annual convention on Dec. 8, 9 and 10, 1885, at Detroit, Mich. The hall in which the meeting will be held is known as the "Red Men's Wigwam," and is located at 63 Michigan Avenue, one block west of the City Hall. Just across the street from the "Red Men's Wigwam" is the Antisdel House, which will be the hotel at which the society will make its head-quarters. The regular rates at this hotel are $2 per day, but they have been reduced to $1.25 per day to those attending the convention. There will be reduced rates on all Michigan railroads, also as far east as Buffalo, as far west as Chicago, and as far south as Toledo. Efforts are being made to secure reduced rates to still further points, but at present the prospects of success are not very promising. No certificates will be sent out until about Dec. 1; but all who expect to attend should write to the Secretary at once, and certificates will be sent out as soon as they are ready.

W. Z. HUTCHINSON, Sec.,
Rogersville, Mich.

PROGRAMME.

FIRST DAY.

TUESDAY FORENOON SESSION—10 A.M.—Convention called to order.—Address of Welcome, by Edwin Willetts, President of the Michigan Agricultural College.—Response by the President, L.C. Root.—Calling the roll of members of last year, payment of annual dues, reception of new members, and distribution of badges.—Reading the minutes of the last meeting.—Reports of the Treasurer and Secretary.—Announcements.—Miscellaneous business.

AFTERNOON SESSION.—2 P. M.—Announcements.—Annual address of the President.—Miscellaneous business.—"Production of Comb Honey," G. M. Doolittle, Borodino, N. Y.—"Production of Extracted Honey," Chas. Dadant, Hamilton, Ill.—"Marketing Honey," C. F. Muth, Cincinnati, O.

EVENING SESSION.—7.30 P. M.—Announcements.—Miscellaneous business.—Discussion of questions that have accumulated in the question box during the day.

SECOND DAY.

WEDNESDAY MORNING SESSION.—9 A. M.—Announcements.—Miscellaneous business.—"Bee Pasturage," Thos. G. Newman, Chicago, Ill.—"Selling and Shipping Bees by the Pound," E. M. Hayhurst, Kansas City, Mo.—Selection of place for holding next convention, and election of officers.

AFTERNOON SESSION.—2 P. M.—Announcements.—Miscellaneous business.—"Excellence or Cheapness: Which?" A. I. Root, Medina, Ohio.—"Comb Foundation," John Vandervort, Laceyville, Pa.—"Beekeeping as a business," Dr. C. C. Miller, Marengo, Ill.

EVENING SESSION.—7.30 P. M.—Announcements.—Miscellaneous busi-

ness.—Discussion of questions in the question box.

THIRD DAY.

THURSDAY MORNING SESSION.—9 A.M. —Announcements. —Miscellaneous business.—"Reversing combs," James Heddon, Dowagiac, Mich.—"The Pollen Theory," Prof. A. J. Cook, Agricultural College, Mich.

AFTERNOON SESSION.—2 P. M.—Announcements. —Miscellaneous business.—"Wintering Bees," Ira Barber, DeKalb Junction, N. Y. —"Different Races of Bees," D. A. Jones, Beeton, Ont.—Adjournment.

W. Z. HUTCHINSON, Sec.

Clinton, Mich.

As many do not fully understand the use of the certificates to secure the benefits of reduced rates, I will try to explain their use.

It makes no difference whether you belong to the North American Beekeepers' Society, or any other society, or ever expect to, if you wish to go to Detroit, Mich., to attend the annual meeting of the several beekeepers' societies to be held at that place on Dec. 8, 9 and 10, you will simply write to W. Z. Hutchinson, Rogersville, Mich., asking for as many railroad certificates as you can use. Mr. H. will book your name and the number of certificates you want, and as soon as he obtains the certificates from the railroad companies, which will be about Dec. 1, he will mail them to you. You will fill out the blank, and when you buy your ticket have the railroad agent fill out his part. If you cannot buy a through ticket to Detroit, buy one for as far as you can, and when you procure a new ticket have the agent endorse on the face of the certificate that he sold you one full-rate ticket from that place to as far as you get your ticket. You may be obliged to get tickets at several places, but always have the agent certify that he sold you a full fare ticket.

When you arrive at Detroit, present your certificates to Mr. Hutchinson, and he will fill out the blank left for that purpose, certifying that you were in attendance at the above-mentioned meeting. Then, on presentation of your certificate properly filled out, you will be able to procure a return ticket by paying one-third the regular fare, thus saving to you two-thirds of the regular fare one way.

This is a great reduction, and will enable many to attend at Detroit that would feel that it would cost too much to go. Then, with the reduced rates at the hotel, it will make your expenses very low. Your committee is still at work trying to make it pleasant for you when you arrive in Detroit. We hope you will all come and make this meeting one long to be remembered by those present. A large sample room at the hotel has been placed at our disposal where you can have every facility to show anything new or of interest to the Society.

Let every beekeeper canvass his neighborhood and find how many will attend, then send to W. Z. Hutchinson for certificates as soon as possible, so that he will know how many to apply for.

H. D. CUTTING.

QUESTIONS AND ANSWERS.

QUESTIONS BY HENRY ALLEY.

1. Which do you prefer, a dovetailed or a nailed section? Please give your reasons for the preference.

2. Will a good colony of bees store as much honey in forty one-pound sections as they will in twenty that hold two pounds each?

3. In tiering up sections, how long would you let the bees work in a set of sections before raising them and placing another set under?

4. Have you ever used sections on a hive without a honey-board between?

5. What was the space between bottom of sections and top of frame?

6. What was the width of top-bar of brood-frame and width of space between each two frames?

7. Were you troubled by the bees building comb between the top of the frames and underside of the sections?

QUESTIONS BY D. D. MARSH.

8. What is the best material to put in cushions, chaff, or sawdust, or leaves?

9. Does it injure a swarm to drive out a half peck or so of bees about the middle of July to sell? the conditions being: it has abundance of bees; the clover harvest is over: no basswood in the locality; and golden rod abundant in September. Will a hive thus treated winter just as well?

ANSWERS BY J. E. POND, JR.

1. A dovetailed as a rule, unless the price is far greater than those to nail; for the reason that they can be put together more quickly and, if made as they should be, they are plenty strong enough; if, however, one should be

found occasionally that does not join tightly, a nail or two will make it a nailed section, to all intents and purposes.

2. In my experience (and in answering any questions that may be propounded, I intend simply to give my own views, and not to say that I *am* right and all who differ, wrong) it will depend on circumstances. If the sections are all placed upon the hives at once, early in the season, the 2-lb. sections will be filled first; but if they are put on as they should be, viz., a few at a time, till the strength of the colony is ready to work in them, it will make little, if any, difference. So, if all are put on the hives at height of season, little difference, if any, will be found.

3. Until they are most of them partly sealed over, unless it appears that more room is needed to prevent swarming or to keep loafers at work. In this latter case I should give all the sections they would occupy, no matter how high they were tiered up.

4. Yes; quite often and with good results.

5. I have set sections directly on the frames and allowed a space of about three-eighths of an inch. The results in both cases were about the same.

6. I have used top bars from $\frac{7}{8}$ inch to $1\frac{1}{4}$ inches in width. The sections should correspond in width to width of top bars. The spaces required for the bees to travel up into sections being scant $\frac{1}{2}$ inch they should have tops and bottoms made same width of the frames used, while the sides should be enough wider to allow of this space between, when the sections are crowded together on top of frames. A $\frac{7}{8}$ inch top bar would require sides of sections to be about $\frac{1}{16}$ in. wide. A $1\frac{1}{4}$ inch would require the sides to be correspondingly larger.

7. Not to do any harm. Of course some brace combs will be built, but as a rule, not enough to be of any great disadvantage or to cause much extra trouble or labor.

8. I do not use cushions at all, for the reason that the material used for filling them must necessarily be crowded more compactly than is advisable. I prefer forest leaves pressed lightly on top of frames. I think coarse chaff would be preferable for cushions; the principle of the preference is stated above.

9. No, I can't see how it can cause any injury. All that is required being to bring the colonies up to full strength before the time comes for packing for winter. I have built up many small three-frame nuclei to the strength necessary for safe wintering after Sept. 1. A hive thus treated will winter just as well as though not so used, if built up strong afterwards, and no trouble will be found in so building up.

ANSWERS BY D. D. MARSH.

1. A *dovetailed*, because it looks more *attractive*, and can be made of *thinner* stock.

2. I should think the *bees* would favor the two pound sections, but the *market* prefers the one pound.

3. Till the comb begins to *crowd* the bees in the sections.

4. I have.

5. Three-eighths of an inch.

6. One inch and an eighth, and the same apart.

7. Never have been to any great extent, so I could not get the sections off readily.

ANSWERS BY L. C. ROOT.

1. All things considered I prefer them nailed. The average person will make a better box and one that will keep its shape best in this way.

2. As I figure they must store nearly the same but not as quickly.

3. If the honey flow has just commenced and is abundant I would add a second tier of boxes as soon as they have started to work in all of the first tier.

Some seasons it will work better, and some colonies will seem to work best, if the additional tiers are added at the top instead of placing them under.

4. I have used them more this way than any other.

5. Three-eighths of an inch scant.

6. Seven-eighths of an inch, with five-eighths of an inch between frames.

7. No, not if sufficient surplus room was provided.

8. Chaff. I use cotton.

9. If they have an abundance of brood and sufficient honey they should not be harmed for successful wintering.

ANSWERS BY G. W. DEMAREE.

1. If the section is to be in *four pieces*, I prefer the nailed section. Reason: because the dovetailed sections are too cranky for my use and patience.

2. Yes, if the apiarist knows just how, and when to do the "tiering up" necessary to the best results.

3. I can get the best results by lift-

ing the cases and "tiering" them when the bees commence to cap the fullest sections, say, when two-thirds of the section combs are drawn to full length.

4. Yes, I have produced thousands of pounds of honey in that way.

5. Practically $\frac{5}{16}$ of an inch.

6. The top bars of frames were seven-eighths of an inch, and space between the top bars as pertains to the wood about one-half inch.

7. Yes. Worried out of all patience. But I accepted the "braces" rather than to accept a pesky honey board. I now have a better system of producing comb honey which will be made plain by my article published in the next "Api".

8. Don't make any cushions. I prefer chaff or cut straw, as a packing for bees.

9. It would depend on how much brood was in the hive. If there are, say, eight combs of brood and young bees cutting out all the time, the young bees would be ready for the fall harvest, and the bees taken from the hive would mostly die off before winter any way, and I don't think they would be missed much. Still I would not like to draw on my colonies so late as that.

ANSWERS BY G. H. MARTIN.

1. Dovetailed more quickly put together.

2. They will not store as much, but if you reduce the width of the section they will store as much. Sections one and three-fourths will hold a pound if well filled sections; one and one-half will hold three-fourth pounds and bees will put as much honey in these as in two pound boxes: at least, that is my experience.

3. Until nearly capped.

4. Yes.

5. Three-eighths inch.

7. Yes.

8. Fine chaff, but I prefer loose chaff or leaves with a few inches of sawdust on top.

9. It does in this locality. To winter well we want fall flowers or fall feeding to stimulate breeding and have plenty of bees.

ANSWERS BY WILL. M. KELLOGG.

1. I prefer a nailed section by all means and would not take the dovetailed section as a gift. My reasons are, that at *no* time are the dovetailed sections anything but frail affairs at best. The least little rack and their stability is gone; one dropped on the floor is a total wreck. They cannot be put together ahead of time with any surety that they will be in good order when needed. In taking off honey, the sections are always stuck fast and the dovetailed needs to be handled very carefully or a loose piece of honey is the result. It is argued that one can put them up so fast that we need not fold them till time to put them on the hives. I, for one, am so crowded with work at that time of the year, that I can't spare even that much time. My surplus arrangements must be ready before the hurrying time. I use one and one-half pound sections, sawed to nail. I can put together one thousand in ten hours, and that is fast enough for me. Can tumble them in a heap in the corner, or pile up, and they keep true. In taking off honey, I work fast, and very seldom crack a comb by the giving of a section.

2. No. The larger the section the more honey will be stored. Give the bees an empty cap if you want to get the *most* honey.

3. Till they have filled the first tier two-thirds or three-fourths full.

4. Yes.

5. Not any space.

6. Top bar of frame $\frac{7}{8}$ inch. About $\frac{5}{8}$ inch space between each two frames.

7. No, could not be.

8. Oat chaff undoubtedly.

9. No. Because the less honey eaten at such a time the better, provided you keep the queen raising more. It will winter as well because the bees for winter should be raised later, and those you sell will be dead long before winter comes any way.

ANSWERS BY A. J. COOK.

1. Dovetailed. I can buy them nicer and cheaper than I can nailed, as they are in the market.

2. Yes, if rightly handled.

3. Long enough to be in all sections and to commence capping central ones.

4. Yes, for years; but shall not any more.

5. Set on frame or else $\frac{5}{16}$ in. above.

6. Varied at different times.

7. Yes, and also by their sticking with propolis.

8. I like fine dry sawdust.

9. Yes, when strong. Especially if fed a little.

ERRATA.

On p. 249 (Nov. No.) in 4th line of J. M. Shuck's article, thin combs *should read* their combs.

On p. 262, in Ans. by L. C. Root, 25th line, bad hives *should read* box hives.

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